RUBBER WORLD

OUR
65th YEAR

A BILL BROTHERS PUBLICATION

JULY, 1954

TABLE OF CONTENTS ON PAGE 49

RUBBER WORLD, July, 1954, Vol. 130, No. 4. Published monthly by BILL BROTHERS PUBLISHING CORP. Office of Publication, 1309 Noble Street, Philadelphia, Pa., with Editorial and Executive Offices at 386 Fourth Avenue, New York 16, N. Y., U.S.A. Entered as Second Class Matter at the Post Office at Philadelphia, Pa., under the act of March 3, 1879. Subscription United States, $5.00 per year; Canada, $6.00; All other countries $7.00; Single Copies 50 cents. Address Mail to N. Y. Office.

Philblack* quality

You can count on the uniform high quality of Philblack for many good reasons.

Our Philblack process is carefully engineered to control critical variables as the selected Philblack feed stream is pyrolytically decomposed in the reactor.

While still loose and fluffy, Philblack is micropulverized to insure that less than a maximum of 0.005% is retained on an 80-mesh screen. Adequate physical and chemical tests are run on the black every two hours to insure constant quality in the Philblack you buy.

Equally important is the constant and strict examination Philblack undergoes in our own rubber evaluation laboratories.

Every Philblack quality of importance to rubber compounders and rubber consumers is investigated thoroughly on a continuing basis.

When you have any problem involving rubber and carbon black, we suggest that you take it up with our skilled staff. The Philblack man who calls on you is up-to-the-minute on rubber compounding technology.

We are always glad to hear from our customers and prospective customers. PHILLIPS CHEMICAL COMPANY, 318 Water Street, Akron 8, Ohio.

*A TRADEMARK

One moving bed catalytic cracking unit (above) and another fixed bed catalytic installation at Phillips, Texas supply recycle gas oil which is processed through a sulfur dioxide extraction plant to yield Philblack feed stock which meets strict specifications.

Abrasion loss of synthetic and natural rubber stocks is fully investigated using production Philblack in standard test recipes. Persistent testing of Philblack performance helps us assure the consistent high quality for which the Philblacks are famous.

Know the Philblacks! KNOW WHAT THEY'LL DO FOR YOU!

A **Philblack A FEF Fast Extrusion Furnace**
Ideal for smooth tubing, accurate molding, satiny finish. Mixes easily. High, hot tensile. Disperses heat. Non-staining.

I **Philblack I ISAF Intermediate Super Abrasion Furnace**
Superior abrasion resistance at moderate cost. Very high resistance to cuts and cracks. More tread miles at high speeds.

O **Philblack O HAF High Abrasion Furnace**
For long, durable life. Good electrical conductivity. Excellent flex. Fine dispersion.

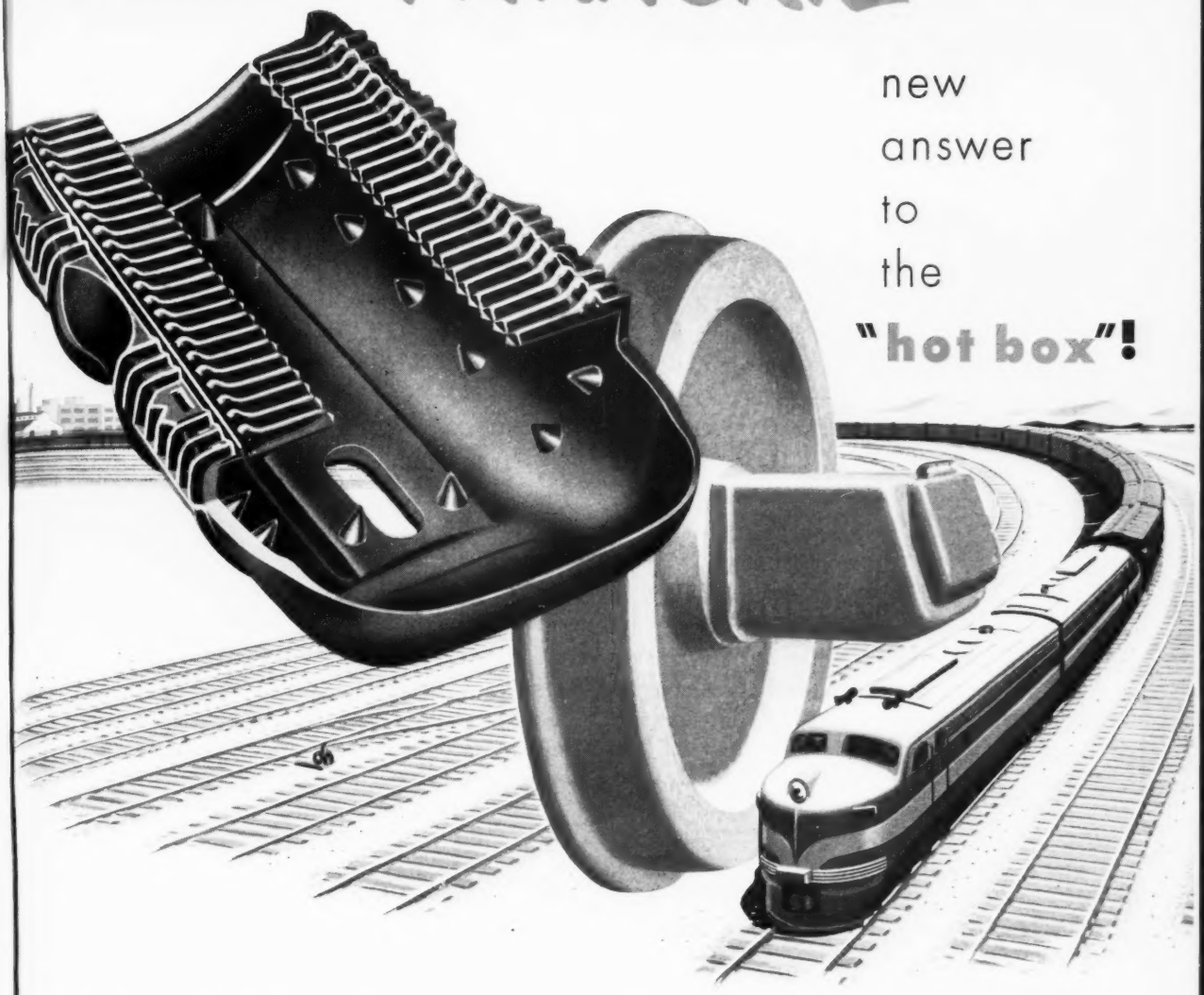
E **Philblack E SAF Super Abrasion Furnace**
Toughest black on the market. Extreme abrasion resistance. Withstands aging, cracking, cutting and chipping.

Phillips 66

PHILLIPS CHEMICAL COMPANY, Philblack Sales, 318 Water Street, Akron 8, Ohio. Export Sales: 80 Broadway, New York 5, N. Y. West Coast: Harwick Standard Chemical Company, Los Angeles, California. Canada: H. L. Blachford, Ltd., Montreal and Toronto.

OIL-RESISTANT # PARACRIL

new answer to the **"hot box"!**



Freight car wheel journals that burn out from lack of lubrication are one of the oldest, most vexing problems of railroading—costly not only in repair work but in freight delay, too.

But now a new packing container made of oil-resistant PARACRIL® chemical rubber takes the heat off wheel journals—*reduces "hot boxes" by 75%!*

This new PARACRIL retainer provides just the flexibility needed to hold the oil-saturated waste against the bearing surface snugly and surely. *And* it supplies a valuable pumping action to keep the packing well saturated with oil.

What's more, this PARACRIL rubber retains its flexibility and resilience at temperatures as low as —45°F—as high as 315°F!

Keeping freight cars rolling (more than 10,000 to date) is but one of *many hundreds* of PARACRIL'S accomplishments—one indication of the possibilities for problem solving this unusual chemical rubber offers *you.* It's available in three general grades of oil resistance, in bale or crumb form, and may be blended with other rubbers or plastic resins.

Better look into PARACRIL today. Simply write on your letterhead to the address below.

50TH ANNIVERSARY 1904 1954 NAUGATUCK CHEMICAL

Naugatuck Chemical

137 ELM STREET
NAUGATUCK, CONN.

Division of United States Rubber Company

IN CANADA: NAUGATUCK CHEMICALS DIVISION • Dominion Rubber Company, Limited, Elmira, Ontario

Rubber Chemicals • Synthetic Rubber • Plastics • Agricultural Chemicals • Reclaimed Rubber • Latices

OIL AND SOLVENT RESISTANCE PLUS

is yours with improved CHEMIGUM

OUTSTANDING oil and solvent resistance *plus* big advantages in processing and other properties are easily and economically yours with CHEMIGUM – first, now finest, of the butadiene-acrylonitrile copolymers.

Compared with other types of rubber, CHEMIGUM is far and away the most resistant to the attack of oils, fats, greases and many solvents. Compared to other nitrile rubbers, CHEMIGUM again gives you outstanding oil resistance *plus* much easier processing, faster sulfurless cures at lower cost, excellent physical properties and superior aging. And to all these plusses, you can add the latest – its lighter, easier-handling bale and its lighter, almost white color.

CHEMIGUM was the first of the nitrile rubbers. Through the years continual improvement has been made in its composition and production. Today, it stands out as an extremely uniform rubber of high, effective acrylonitrile content – specifically designed to process as do GR-S type rubbers. CHEMIGUM does not toughen on the mill, but actually softens with heat and mastication – a real, cost-saving feature.

Important, also, to costs are the easy-to-handle, 50-pound bale and the fact that CHEMIGUM gives you tight, sulfurless cures – permitting you to meet the most rigid automotive or military specifications – in much less time with less of the usual acceleration or with less costly ingredients.

But the best place to prove the oil and solvent resistance *plus* the other advantages of CHEMIGUM is in your own laboratory. Why not write for samples and full technical help, today? Just address your request to:

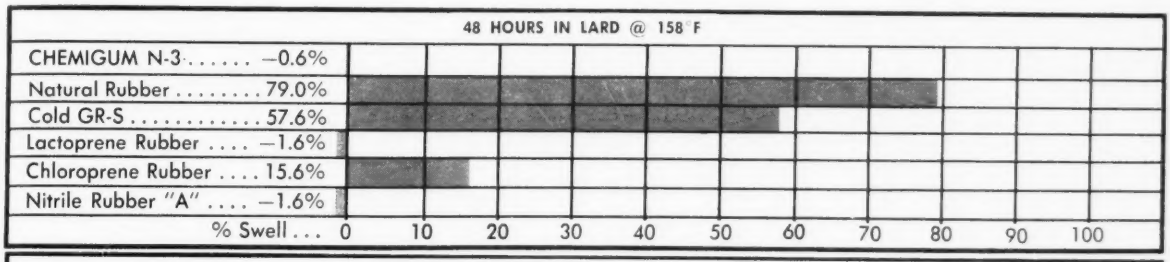
Goodyear, Chemical Division, Akron 16, Ohio

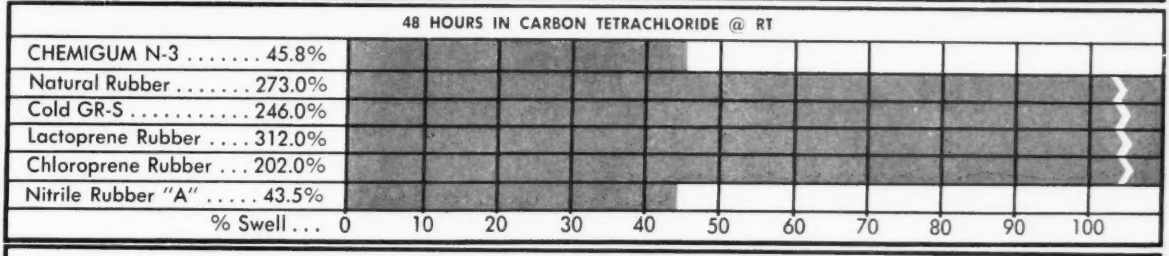
CHEMICAL GOODYEAR DIVISION

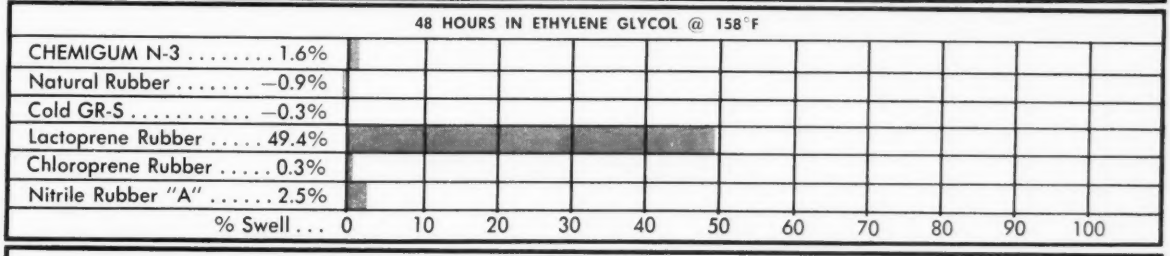
Superior Oil and Solvent Resistance – Comes with CHEMIGUM!

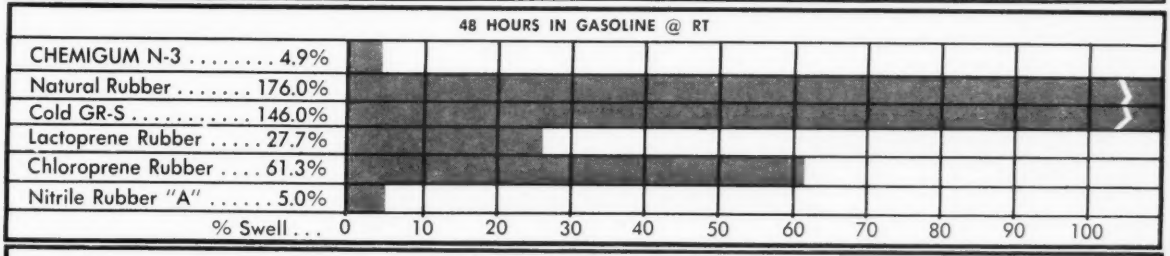
Here are the results of a series of tests which prove that CHEMIGUM offers the best all around resistance of any rubber, including one of high acrylonitrile content, to oils, fats, greases and solvents.

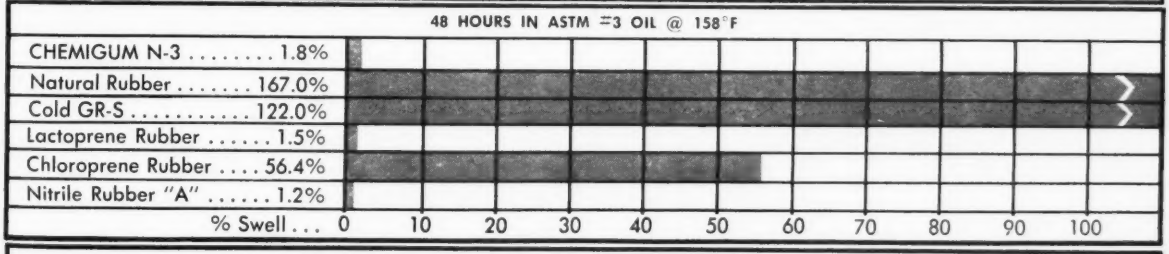
A basic black compound was used with only the small changes necessary for proper cure of each type of rubber. The immersion tests were conducted on samples of the best cure for each stock.

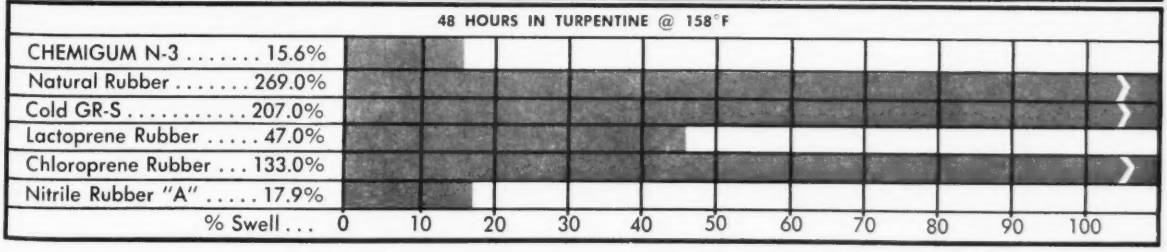












MILLEX

LOW COST

LOW GRAVITY

Compounding Ingredient for Rubber and Rubber-Like Materials!

PROPERTIES

Physical Form	Friable solid
Color	Brown
Specific Gravity	1.04
Melting Point	250° F. (approx.)

MILLEX is a selected Gilsonite base product specially compounded to render it readily miscible with rubber and rubber-like materials.

MILLEX is recommended for use in wire insulation, tapes, soles and heels, boots and shoes, and extruded goods, cured in air or open steam. It is also recommended as a low cost, low gravity extender for semi-rigid vinyl resin compounds.

COMPOUNDING CHARACTERISTICS:

In GR-S, natural or reclaimed rubber, MILLEX improves processing and flattens stocks without undue softening before, during and after cure. Thereby smooth tubing and calendering and clean embossing are obtained. Freedom from flow and sagging in open cures is also enhanced. Good mill release and freedom from tackiness, particularly in high reclaim stocks, are obtained with MILLEX.

Cured stocks show good hardness, modulus and extremely smooth finish. Electrical behavior is excellent and moisture absorption is low.

MILLEX is compatible with vinyl resins and lends itself to semi-rigid uses, such as records, chemical resistant conduits, flooring, paneling, etc.

MILLEX while dark brown in color has relatively low hiding power and can be used for light brown or tan colored compositions, such as soles or heels.

MILLEX should be added directly to GR-S or rubber during breakdown period for best results.

Write for Literature and Working Samples

Cary Chemicals Inc.

Successors to BURGESS CHEMICAL CO.

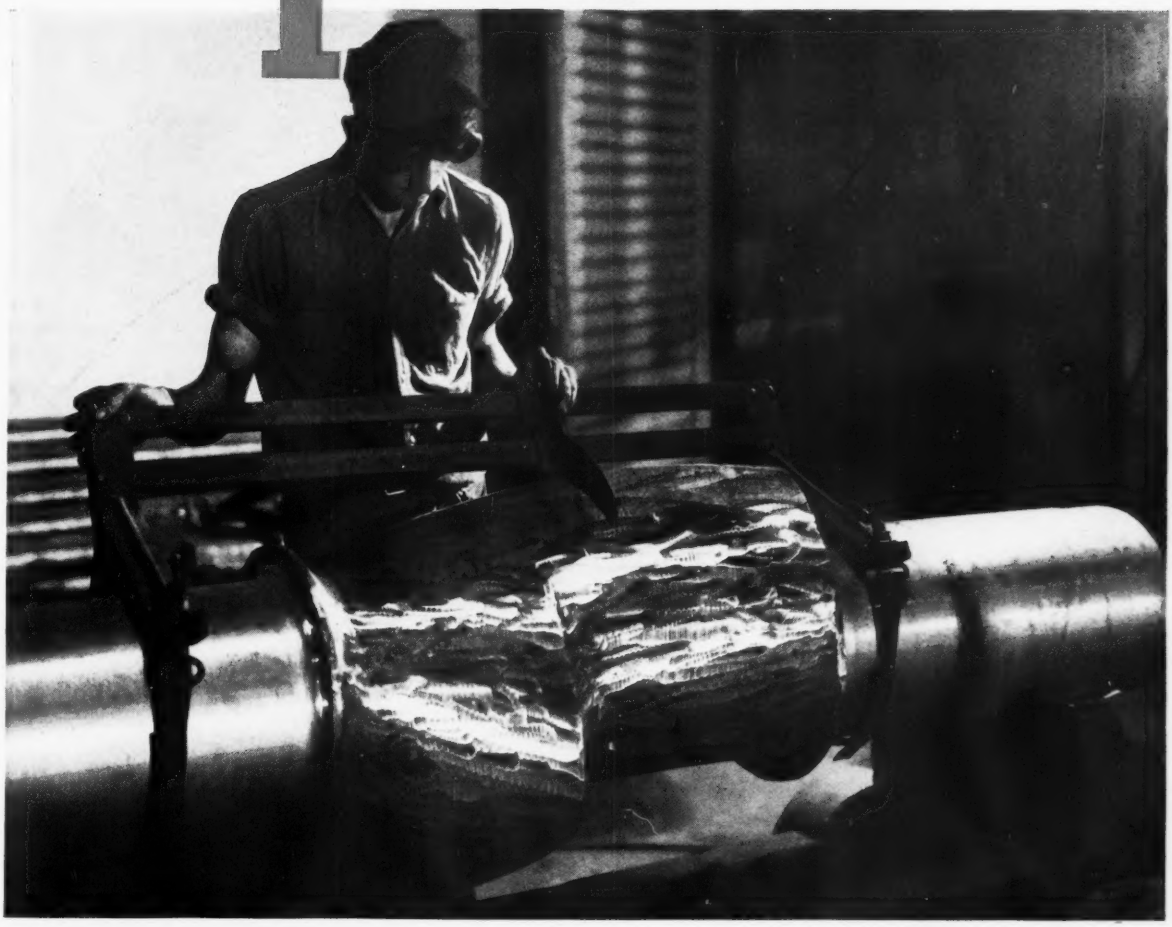
Executive Sales Offices: 64 HAMILTON STREET, PATERSON 1, NEW JERSEY

Laboratory & Plant: RYDERS LANE, MILLTOWN, NEW JERSEY

CARY CHEMICALS PRODUCTS:

- Vinyl Compounds
- Vinyl Plasticizers
- Vinyl Resin
- Reclaiming Oils
- Sun Checking Agents
- Esters
- Stearine Pitches

1 of 42 operations



eliminating the guesswork from Banbury* rotor repair

The body, journals and gear fits of this Banbury rotor have been built up to full original dimensions, machined and ground. The body is now being gauged for size—one of the forty-two separate operations, including three nondestructive tests for soundness, performed on all rotors rebuilt by Farrel-Birmingham.

Soon going back into service—as "good as new"—the future of this rotor did not always look so bright. It was returned to us with severe pits, the shaft out of alignment, and the bearing surfaces badly scored. As any corrective machining would have made the rotor undersize, both body and necks first had to be built up to the proper dimensions.

There is no guesswork in determining these dimensions. They are found in the exclusive blueprints used in making the Banbury originally.

There is also no substitute for the experience and facilities of Farrel-Birmingham. No other company has the blueprints, jigs, fixtures and gauges to which new machines are built and which are necessary for satisfactory repairs. Service is further facilitated by the largest stock of standard parts and complete Banbury bodies in existence.

For the most thorough Banbury rebuilding, write, wire or telephone one of the offices listed below.

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONN., (Ansonia 4-3331)
AKRON, OHIO, 2710 First National Tower (POrtage 2-8871)
CHICAGO, ILLINOIS, 120 So. LaSalle St. (ANdover 3-6434)
LOS ANGELES, CALIF., 2032 Santa Fe Ave. (Lafayette 3017)
HOUSTON, TEXAS, 860A M & M Building (Capital 6242)

*Trade-mark

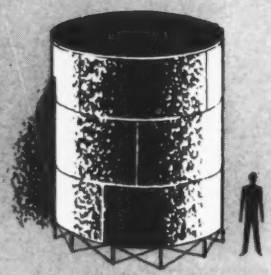
Farrel-Birmingham®

FB-914

This is our source

From the cottonseed, A. Gross & Company produces for you Distilled Cottonseed Fatty Acids used in the manufacture of soaps, polishes, insecticides, lubricating greases, alkyd resins, adhesives, buffing compounds, grease sticks, and for the compounding of rubber.

. . . let A. Gross be yours



If you are looking for HIGH FATTY ACID CONTENT at low price, or a double distilled grade where the essential requirement is light coloration, A. Gross & Company should be your source of supply for Cottonseed Fatty Acids.

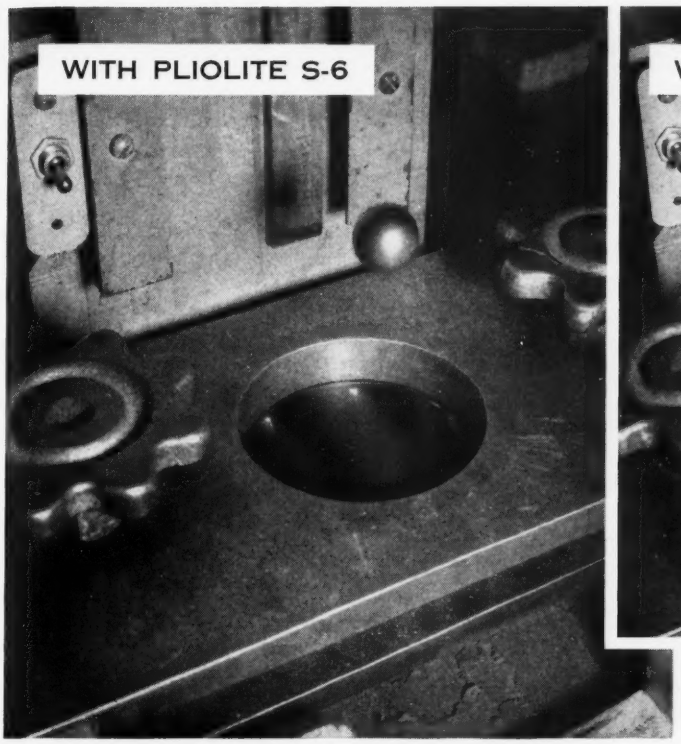
Send for samples and our catalog "Fatty Acids in Modern Industry."

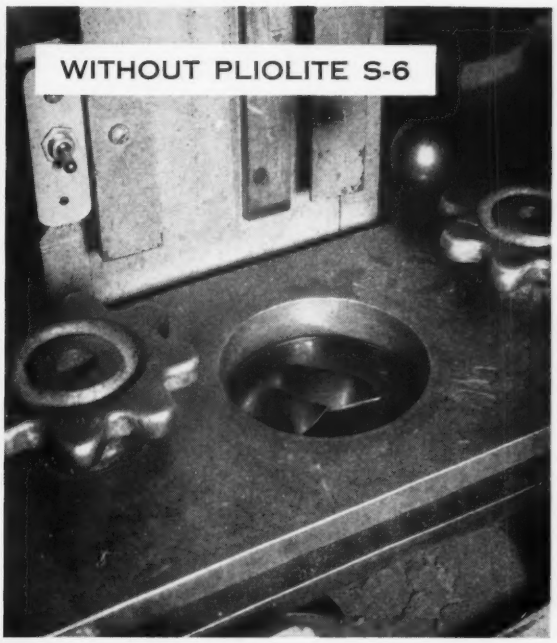
	GROCO 35 — DOUBLE DISTILLED	GROCO 30 — DISTILLED
Titre	36°— 39° C.	33°— 36° C.
Lovibond 5¼" Red	1.0 — 2.0	5 — 10
Lovibond 5¼" Yellow	5 — 15	30 — 50
Color Gardner 1933	1 — 3	
Unsaponifiable	1.5% max.	2.0% max.
Saponification Value	201 — 206	200 — 204
Acid Value	200 — 205	199 — 203
Iodine Value (WIJS)	90 — 100	95 — 110

A. GROSS & COMPANY

295 Madison Ave., New York 17, N. Y. Factory, Newark, N. J.

Distributors in Principal Cities Manufacturers Since 1837





FALLING BALL TESTS PROVE greater impact resistance of hard rubber made with PLIOLITE S-6. Samples were photographed immediately after being struck with 0.7" dia. steel ball weighing 67 grams and dropped from height of 5½ feet

TOUGHER HARD RUBBER

is easier made with PLIOLITE S-6

Hard rubber manufacturers always have been hard put to overcome an inherent limitation of their product—low impact resistance. They also have been plagued with difficult processing and generation of heat in the curing of high sulfur stocks.

Answers to all three of these problems are now at hand through the use of PLIOLITE S-6 – Goodyear's rubber reinforcing, high styrene copolymer. Recent studies and tests have proved that incorporation of PLIOLITE S-6 in hard rubber gives these improvements:

1. Much higher impact strength, depending upon the amounts of resin and sulfur used.
2. Use of lower sulfur levels without reduction in hardness, stiffness, tensile strength or softening point.
3. Safer production through control of the exothermic curing reaction plus permitted use of thicker sections and faster cures.
4. Easier production through nerve reduction and stiffening of the stock to give better handling, milling and preforming properties.
5. Better appearance of the cured stock surface.

For further details on how to produce tougher hard rubber easier with PLIOLITE S-6, write to:

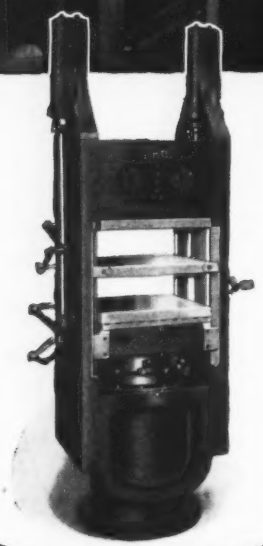
Goodyear, Chemical Division, Akron 16, Ohio

CHEMICAL GOODYEAR DIVISION

Pliolite, Chemigum, Pliobond, Pliovic—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

Use-Proved Products — CHEMIGUM · PLIOBOND · PLIOLITE · PLIOVIC · WING-CHEMICALS — The Finest Chemicals for Industry

300 TON ERIE
Hydraulic Presses



Versatility in Rubber Molding

IN one of the Rubber Industry's largest plants, these 10 Erie 300 Ton Hydraulic Presses are molding a multitude of rubber products. Each Erie press shown here has four 3 ton pushback cylinders. Main rams are ground from chilled iron. Pushdown rams are of stainless steel. All glands and guides are bronze. Each press has two 6 inch openings and 24 inch by 24 inch platens. Nearly a half-century of engineering "know how" in designing Erie Foundry Company hydraulic presses is matched by unexcelled craftsmanship in producing this equipment for the rubber and plastics industry. Let Erie Foundry Company Engineers consult with you on your hydraulic press problems. Bulletin 350 gives full details on Erie Foundry Company Hydraulic Presses. Write for it.

ERIE
FOUNDRY COMPANY
HYDRAULIC PRESSES

ERIE FOUNDRY COMPANY • *Erie, Pa., U.S.A.*

DETROIT • 335 Curtis Building
CHICAGO • 13 South Austin Blvd.
INDIANAPOLIS • 2302 N. Meridian Street
NEW ENGLAND • G. V. Eads, Kent, Conn.

.A.

AND
, Conn.

ORLD

A versatile, low-cost basic raw material

PICCOPALE

PICCO

100% polymerized petroleum resins

PICCOPALE is a completely new and different type of synthetic resin, available in very large quantities (by the trainload, if you wish!) and at a price so low that it can be used as a basic raw material. Physical and chemical properties are given at the right, and representative applications below. Send for complete data and samples for study and experiment.

USED FOR A WIDE VARIETY OF PRODUCTS

TEXTILES—As a size for wool carpets and rugs . . . as a nonskid material . . . as a waterproofing for mats from fibres. Size for felted and nonwoven goods produced from textiles. Varnishes for insulating and coated fabrics. Wax mixtures and waterproofing for cordage and twine. Compounds for canvas and duck.

WOOD PRODUCTS—Priming and impregnating compositions for mill work. Special coatings for cooperage barrels, pails, kegs, tubs.

PULP AND PAPER—Size and binder for alkaline filled papers. Wax mixtures for coating and glazing paper. Binder for clays in coated paper. Laminating compound for built up boards. Stiffening agent for paperboard containers, boxes, cans, drums, tubes.

CHEMICALS—As a compounding aid for plastic materials and rubbers. Extender, carrier, and adhesive in the compounding of insecticides and fungicides. Additive for laminating and polish waxes. Maleic anhydride adducts.

PROTECTIVE COATINGS—Water based paints. Oleo resinous varnishes. Caulking compounds. Newspaper inks. Rust preventitive coatings.

RUBBER—As a softener in the manufacture of casings and inner tubes. Tackifier in solvent type rubber and latex type cements. Compounding aid in rubber footwear. Reclaiming agent in pale reclaim rubber. Hardening and dispersing aid in miscellaneous industrial and mechanical goods.

LEATHER—Compounding aid for packing and belting. Latex additive for waterproofing and impregnating innersoles. Ingredient in compounds for the stiffening and hardening of box toes, counters and soles.

CEMENTS—Resin ingredient in membrane concrete curing. Coating for glass fibers and mineral wool for insulating batts. Integral waterproofing for asbestos papers, gaskets, and insulation.

METALS—Ingot molds coating. Sealing compounds for cans. Potting and setting compounds for assemblies. Anti-rust coating for various metal forms. Drawing compounds.

OTHER USES—Ingredient in all-weather insulation, rubber covered wires and plastic covered wires. Tackifier in rubber-resin combinations for adhesive tapes and plasters. Resinous extender for fabricated plastic rods, tubes, and pipes. Compounding material for chewing gum base.

Properties of PICCOPALE

Physical

Form	Thermoplastic Solid
Softening Point, Ball and Ring	100 ± 3°C.
Specific Gravity at 25/25°C.	.970 — .975
Pounds Per Gallon	8.12
Color: Gardner Scale	13 Max.
Flash Point C.O.C.	500°F.
Fire Point	520°F.
Refractive Index at 20°C.	1.528

Chemical

Acid Number	Less than 1
Saponification Number	Less than 2
Ash	0.2% Max.
Iodine Value (WIJS)	120
Iodine Value (Corrected for Substitution)	30
Bromine Number	7.3
Molecular Weight	1100
Double Bonds Per Mol. (Bromine Number)	1

Grades Available

Grade	Melting Point—Ball and Ring °C.	Form
Piccopale 100	100 ± 3°C.	Solid or Flaked
Piccopale 85	85 ± 3°C.	Solid
Piccopale 70	70 ± 3°C.	Solid
Piccopale 100 Sol.	.....	60% Solids in Mineral Spirits
Piccopale Emulsion		50% Solids

PENNSYLVANIA INDUSTRIAL CHEMICAL CORP.
CLAIRTON, PENNSYLVANIA

Plants at: Clairton, Pa.; West Elizabeth, Pa.; and Chester, Pa.

District Sales Offices
New York, Chicago, Philadelphia, Pittsburgh
Distributed by HARWICK STANDARD CHEMICAL COMPANY, AKRON 5, OHIO

Pennsylvania Industrial Chemical Corp. (RW)
Clairton, Pennsylvania

Please send samples of PICCOPALE for (application):

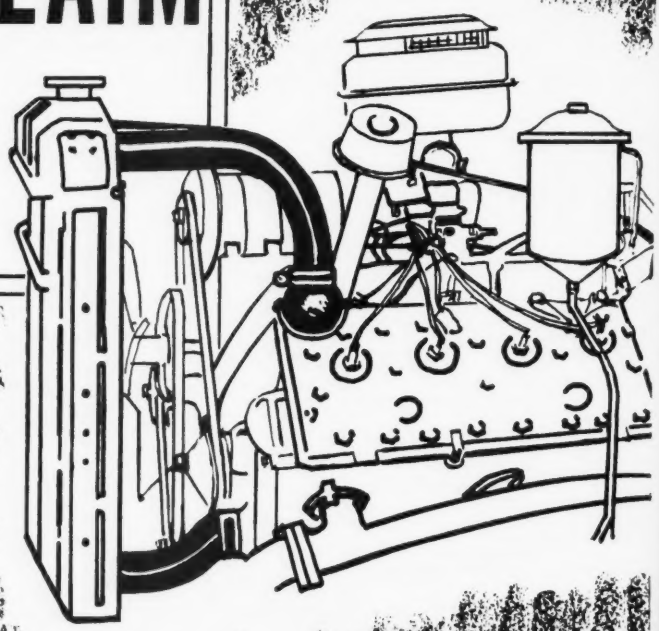
_____

NAME _____ POSITION _____

COMPANY _____

ADDRESS _____

Pequanoc BUTYL RECLAIM #5950



- Fast Mixing
- Smooth Extruding
- Tight Cure

FOR BUTYL RADIATOR HOSE

FORMULA A-381-8

PEQUANOC 5950 BUTYL RECLAIM	51.00
GRI 18	8.00
FEF Black	20.00
Hard Clay	11.20
Zinc Oxide	1.90
Process Oil	6.16
Sulfur	1.20
Tetraethyl Thiuram Disulfide	.36
Zenite or OXAF	.18
	100.00

Press Cure	30 Min. @ 287°F.
Tensile	1050 p.s.i.
Elongation	350%
Duro "A"	70
Est. Lb. Cost	.1080
Specific Gravity	1.32
Vol. Cost	.1315

Pequanoc Rubber Co.

MANUFACTURERS OF RECLAIMED RUBBER

MAIN SALES OFFICE and FACTORY: BUTLER, N. J.

WORLD

makers of... Quality Carbon Blacks

When talking about carbon blacks — no matter where — the thoughts invariably go to UNITED. The reason is simple enough: UNITED blacks have a long-established record for top notch quality, consistent uniformity and pleasing performance.

The widely known Kosmobile (channel) and Kosmos (furnace) brands made from gas or oil represent a complete range of reinforcement.

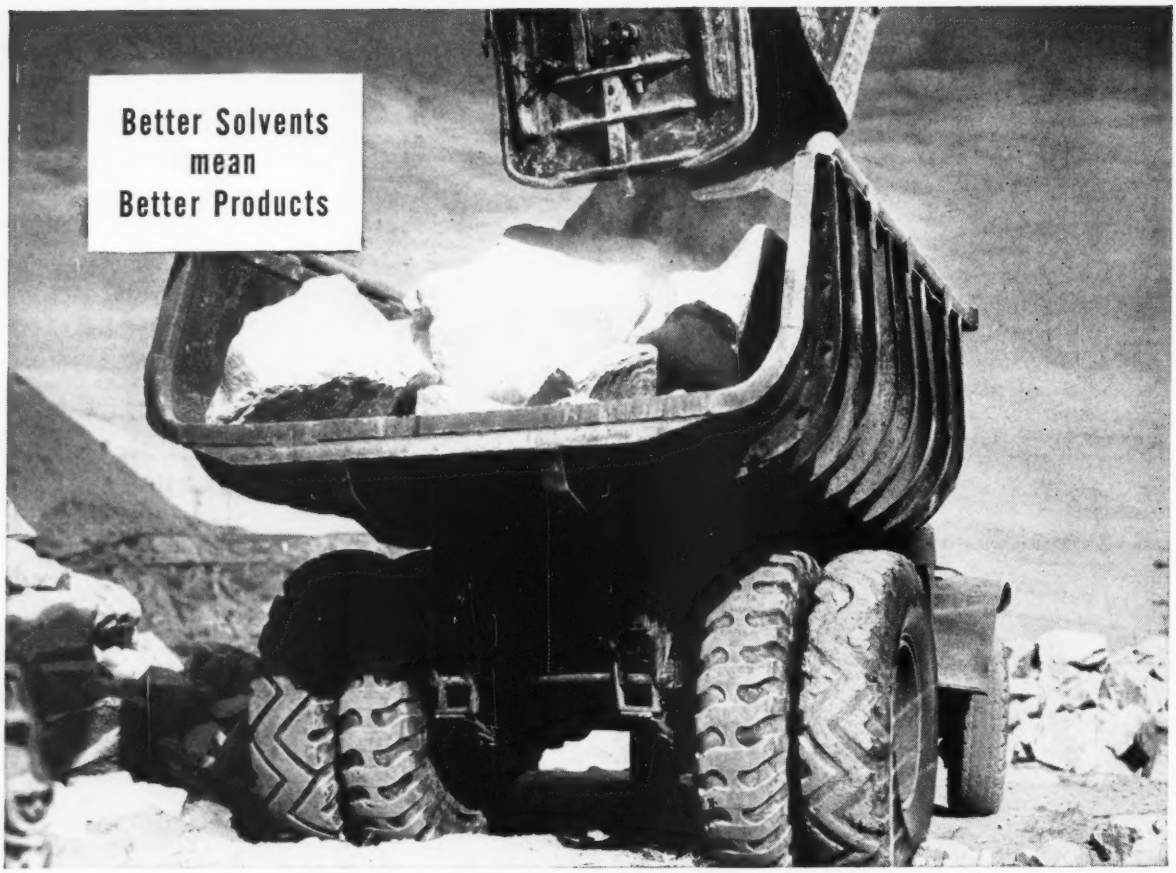
Naturally, leaders everywhere use UNITED blacks. Follow the leaders.

UNITED's technical literature, a valuable reference for the entire rubber industry, will be sent free upon request to our Research Division.

UNITED CARBON COMPANY, INC.

CHARLESTON 27, WEST VIRGINIA

NEW YORK • AKRON • CHICAGO • BOSTON • MEMPHIS



Is your product "Under Pressure" too?

Skellysolve for Rubber and Related Industries

Applications

SKELLYSOLVE-B. For making quick-setting cements for the shoe, tape, container, tire and other industries. Quick-drying, with no foreign taste or odor in dried compound. Closed cup flash point about —20°F.

SKELLYSOLVE-C. For making quick-setting cements with a somewhat slower drying rate than those compounded with Skellysolve-B. Closed cup flash point about 13°F.

SKELLYSOLVE-D. For cements and variety of manufacturing operations. Good odor. Quick drying. Minimum of heavy, greasy compounds. Closed cup flash point about 3°F.

SKELLYSOLVE-H. For general use in manufacturing operations and cements, where faster evaporation rate than that of Skellysolve-D is desired. Closed cup flash point about —20°F.

SKELLYSOLVE-V. For use wherever a relatively slow drying solvent is desired. Closed cup flash point about 50°F.

SKELLYSOLVE-R. For general use in tire building and a variety of other manufacturing operations and cements. Reduces evaporation losses. Medium quick final dry. Lessens bloating and skinning tendency. Closed cup flash point about —25°F.

"Doc" MacGEE says: Whatever the nature of your product, it's sure to be "under pressure"—under the pressure of competitive products that are forever bidding for the favor of the customer. Strict quality control is the obvious method of keeping your customers sold on your product . . . and this is where Skellysolve forms an important part of your manufacturing picture.

You can bank on Skellysolve for the uniformity that helps to protect your product's high quality. Every batch has the same overall properties you need to keep your plant's production line flowing smoothly. Such dependability results from strict laboratory controls during every step of the Skellysolve manufacturing process. Skellysolve is not a "sideline" but a major product operation of a major oil company.

Run your own tests on Skellysolve and decide! Check its low end point, rapid evaporation, low vapor pressure, minimum of unsaturates and pyrogenic decomposition products. See what Skellysolve's minimum of low and high boiling compounds means in reduced rejects due to blushing and blisters. See how controlled vapor pressure guards against bloated containers. Note the minimum of low boiling compounds that eliminates "seeds" from rubber cements . . . and the minimum of high boiling compounds that gives high bonding strength free from greasy residues.

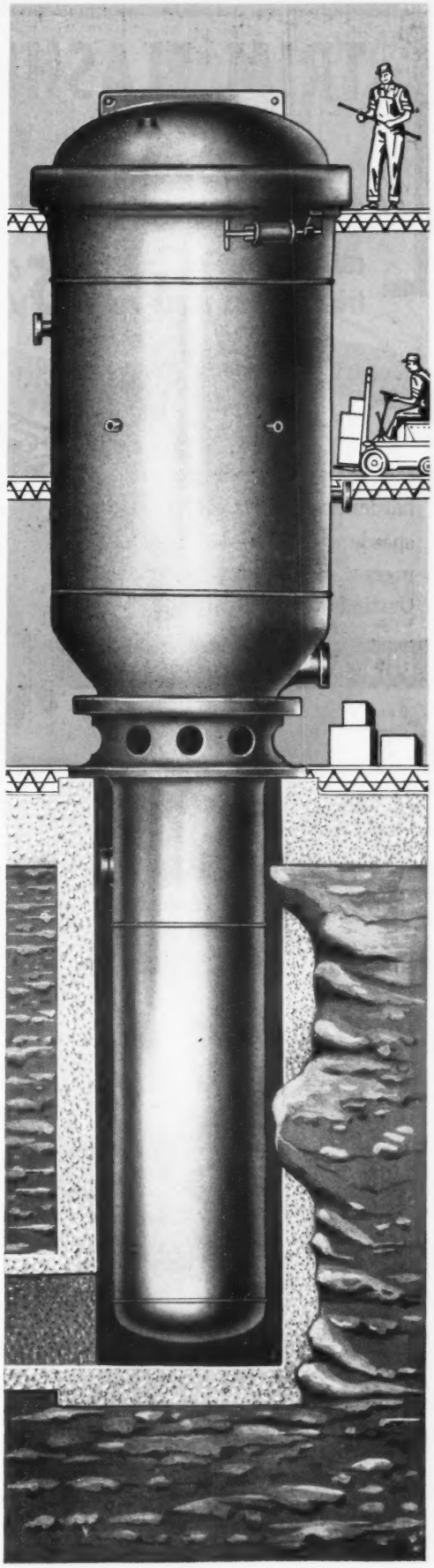
Special help wanted? Solvent application problems are the specialty of the Skellysolve Technical Fieldman. Send for him, he's always at your service. Or write for more complete technical facts.

SKELLY

Skellysolve

SOLVENTS DIVISION, SKELLY OIL COMPANY
KANSAS CITY, MISSOURI

need a vulcanizer 4 stories high?

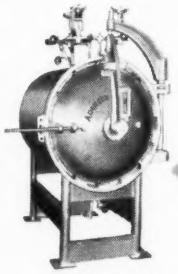


Probably not.

Maybe all you need is a small job—a relatively simple one—or perhaps a very special one for some unusual curing process. Big or little, conventional or special, makes no difference to ADAMSON engineers. For designing and building rubber or plastics processing equipment is our business; and has been for more than 60 years. Given product specifications and other relevant data, we'll create, design and construct from scratch, the machinery and processes needed to meet your manufacturing requirements.

So, whether it's vulcanizers 4 stories high, calenders, mills, presses or other processing equipment, remember: *Adamson engineers can design it . . . Adamson mechanics can build it.*

Call us when modernization or expansion is in the air. You'll be glad you did.



This is the Largest Ram-type Vertical Pot Heater ever built. It is 40 ft. high . . . weighs 200 tons, and has a capacity of 1400 tons. We built it to vulcanize 112 inch off-the-road tires—4 at a time—for one of the large tire manufacturers.

A small 36" laboratory vulcanizer.

ADAMSON UNITED COMPANY

730 Carroll Street • Akron 4, Ohio

SALES OFFICES IN PRINCIPAL CITIES

Subsidiary of United Engineering and Foundry Company

Plants at: Pittsburgh • Vandergrift • New Castle • Youngstown • Canton

TRIM FLASHING in a Flash

and Clean as a Whistle!

Western's RMH Machine

cuts the cost of trimming as much as **75%**

a factory in a foot of space!

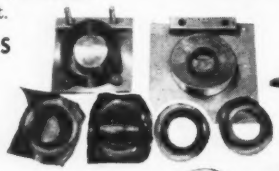
FEATURES: Cuts on replaceable hardened steel plate. Foot control speeds operation. Simple, positive pressure adjustment. ½ H.P. motor. Cutting area approx. 8½" x 9".

CUTS, PUNCHES and TRIMS in one swift operation!

DIES ARE OUR SPECIALTY

2 and 3 level dies are made for RMH. Change dies in just a few seconds with positive alignment.

FLASHING TRIM DIES
CLICKER DIES
WALKER DIES
I. D. and O. D. DIES
MALLET DIES
MACHINE DIES



POSITIVE SAFETY FEATURES

Machine *cannot* trip accidentally. Operator can view entire operation.

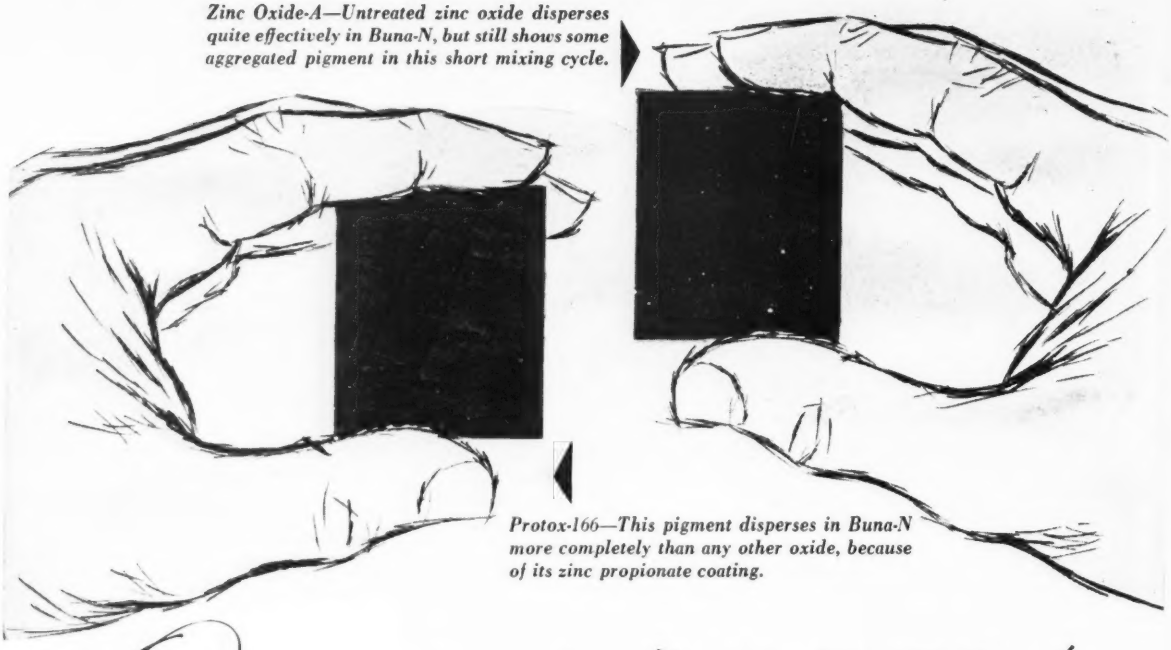
GET THE FULL STORY on Western Machines and Dies by sending for our free illustrated catalog today.

SEND SAMPLES of parts to be cut and flash trimmed for our recommendations.

For Versatility— "Go Western"

Western SUPPLIES CO.

2920 CASS AVE., ST. LOUIS 6, MO.



Zinc Oxide-A—Untreated zinc oxide disperses quite effectively in Buna-N, but still shows some aggregated pigment in this short mixing cycle.

Protox-166—This pigment disperses in Buna-N more completely than any other oxide, because of its zinc propionate coating.

Outstanding for DISPERSION

...PROTOX* ZINC OXIDES

Protox oxides speed your processing and upgrade your compounds... because they disperse faster and more completely than conventional oxides, even under adverse conditions.

IN ANY WEATHER

One of our first customers for Protox was a rubber manufacturer who was troubled by poor zinc oxide dispersion on hot, humid days. Protox-166 eliminated that difficulty.

IN ANY RUBBER

Protox oxides definitely plasticize Buna-N and other hard-to-process elastomers, thus providing softer, easier-working stocks.

This plasticizing effect does not hinder the dispersion of Protox oxides, because their unique coating of zinc propionate serves both as plasticizer and dispersing agent.

Where can Protox oxides cut your costs and improve your compounds?

We shall be glad to discuss that question with you.

*U. S. Patents 2,303,329 and 2,303,330

THE NEW JERSEY ZINC COMPANY

Producers of Horse Head Zinc Pigments

... most used by rubber manufacturers since 1852

160 Front Street, New York 38, N. Y.

HORSE HEAD PRODUCTS

here are 4 good reasons why STAUFFER leads in SULPHURS:

1 Crystex
(85% insoluble sulphur)
does *not* bloom
on uncured stock

2 Tire Brand
(99.5% pure) sulphur
for general use

3 Tube Brand
refined to meet special requirements

4 Special Flowers
(30% insoluble)
lowest cost per unit of "I.S."

STAUFFER SULPHURS for rubbermakers are available in various forms, to serve every purpose in the rubber industry. All sulphurs from Stauffer are carefully manufactured to meet exacting specifications.

AND SPECIAL PURPOSE GRADES OF SULPHUR

In addition to superior sulphur products, Stauffer has available these quality chemicals for the industry:

CAUSTIC SODA
CARBON TETRACHLORIDE
CARBON DISULPHIDE
SULPHUR CHLORIDES
BORAX

"You can always depend on chemicals from Stauffer!"

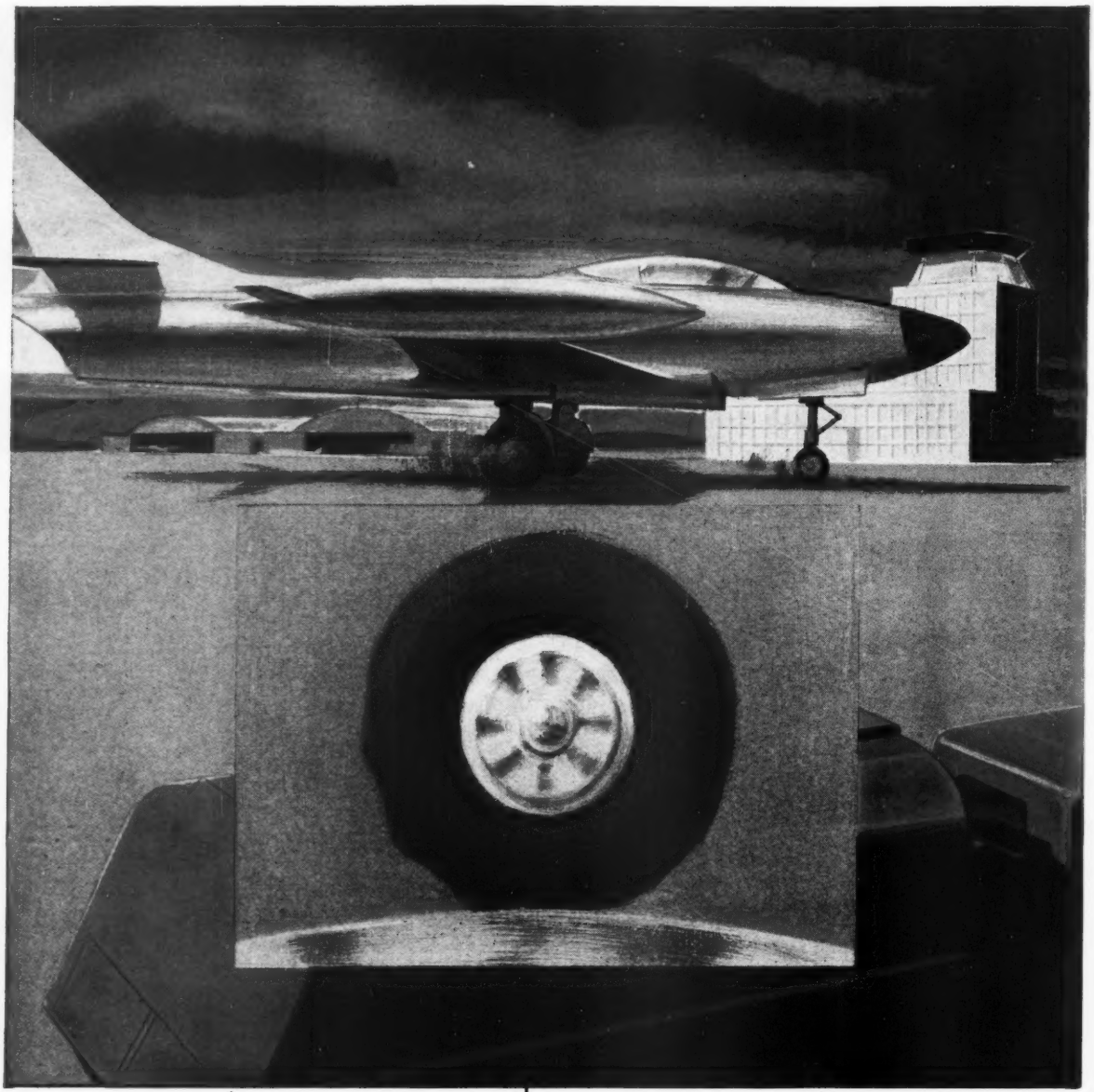
Send *now* for literature fully explaining the advantages and uses of these and other Stauffer products.

STAUFFER CHEMICAL COMPANY

380 Madison Ave., New York 17, New York • 221 North LaSalle St., Chicago 1, Illinois • 824 Wilshire Blvd., Los Angeles 14, California • 326 South Main St., Akron 8, Ohio • 636 California St., San Francisco 8, California • P.O. Box 7222, Houston 8, Texas • Apopka, Florida • North Portland, Oregon • Weslaco, Texas

Stauffer CHEMICALS SINCE 1885

GEN-TAC* Adhesion



KURE-BLEND® MT MASTERBATCH.
50% TETRAMETHYL THIURAM DISULFIDE AND 50% GR-S TYPE RUBBER

- Fast, easy mixing
- Excellent dispersion
- Dust-free
- Accurate weighing

KO-BLEND® I. S. INSOLUBLE SULFUR.
50% CRYSTEX AND 50% GR-S TYPE RUBBER

- Controls sulfur bloom
- Eliminates discoloration of light stocks
- Insures good dispersion
- Cuts milling time

withstands this whirling torture

A jet plane tire develops these distorting traction waves when tested at 250 miles per hour. The adhesion of the rubber to the Nylon carcass plies must resist the tremendous deformation and centrifugal forces which tend to tear the tire apart at high speeds.

Gen-Tac Latex provides adhesion as great as the strength of the Nylon itself and makes it possible to produce tires that will absorb this terrific whirling punishment.

This same bonding strength has also proven itself over and over in actual field conditions in the better passenger and truck tires, V-belts, conveyor and transmission belting, hose and proofed goods made from either Rayon or Nylon. Wherever adhesion is vital to safety and performance you can turn to Gen-Tac—the proven bonding latex.

For further information on Gen-Tac or other General Tire Chemical products just fill out the coupon below.

*T. M. GT&R Co.

Creating Progress Through Chemistry

Chemical Division
GENERAL
THE GENERAL TIRE & RUBBER CO.

GEN-TAC

The General Tire & Rubber Company, Chemical Div.,
1708 Englewood Ave., Akron 9, Ohio

Send literature on ☐ Gen-Tac
☐ Ko-Blend ☐ Kure-Blend

☐ Have your representative contact us

Send sample of
☐ Gen-Tac ☐ Kure-Blend ☐ Ko-Blend

NAME_____

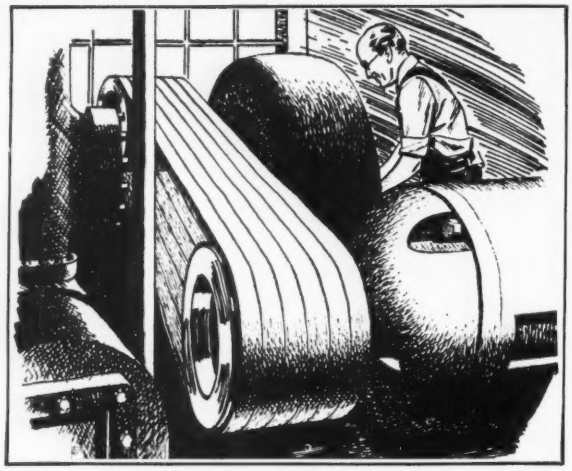
COMPANY_____

STREET_____

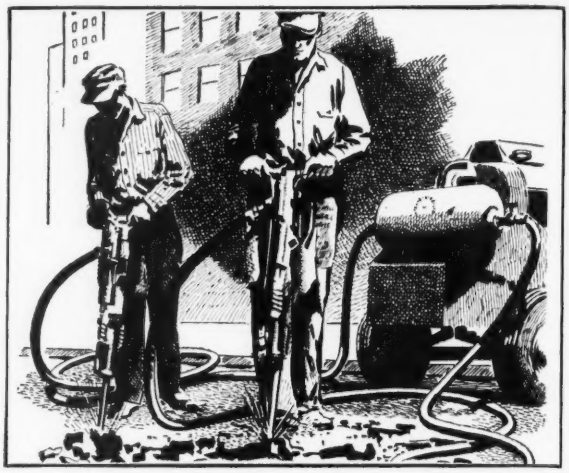
CITY_____

STATE_____

RW-7-54

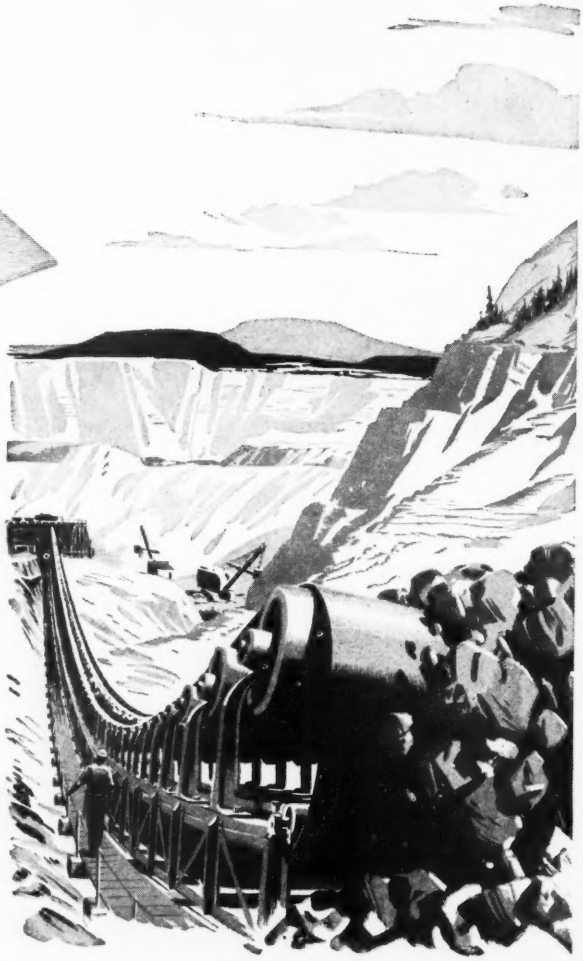


Wellington Sears has both cotton and synthetic fabrics to insure top performance and long life in products such as power transmission belts.



Shawmut Hose Duck is a soft, strong, plied-yarn fabric affording flexibility and good impregnation in a variety of hose applications.

YOU GET LONG SERVICE LIFE WITH WELLINGTON SEARS BELTING DUCK



Experienced industrial users specify Shawmut Belting Duck wherever exceptional strength, good adhesion, and bulking properties, *plus* economical cost, are needed, as in heavy-duty conveyor belts.

Product of an organization that has specialized in heavy-duty fabrics for over a century, this sturdy, pliable belting duck owes its strength to the carefully controlled construction and twist of the rugged plied yarns in the warp and filling.

With a complete line of cotton ducks for belting, hoses, and other mechanical rubber applications, Wellington Sears also has developed fabrics utilizing the unique properties of nylon, high-tenacity rayon, and other fibers.

If it's a rubber-and-fabric problem, talk it over with Wellington Sears.

Write for your free copy of "Modern Textiles for Industry" which includes pertinent information on rubber applications. Address: Wellington Sears Co., Dept. K-5, 65 Worth St., N. Y. 13.

Superior Fabrics for the Rubber Industry

- Belting duck
- Hose duck
- Enameling duck
- Army duck
- Single and plied-yarn chafers
- Sheeting
- Airplane cloth
- Balloon cloth
- Nylon, high tenacity rayon, other synthetics and combinations.

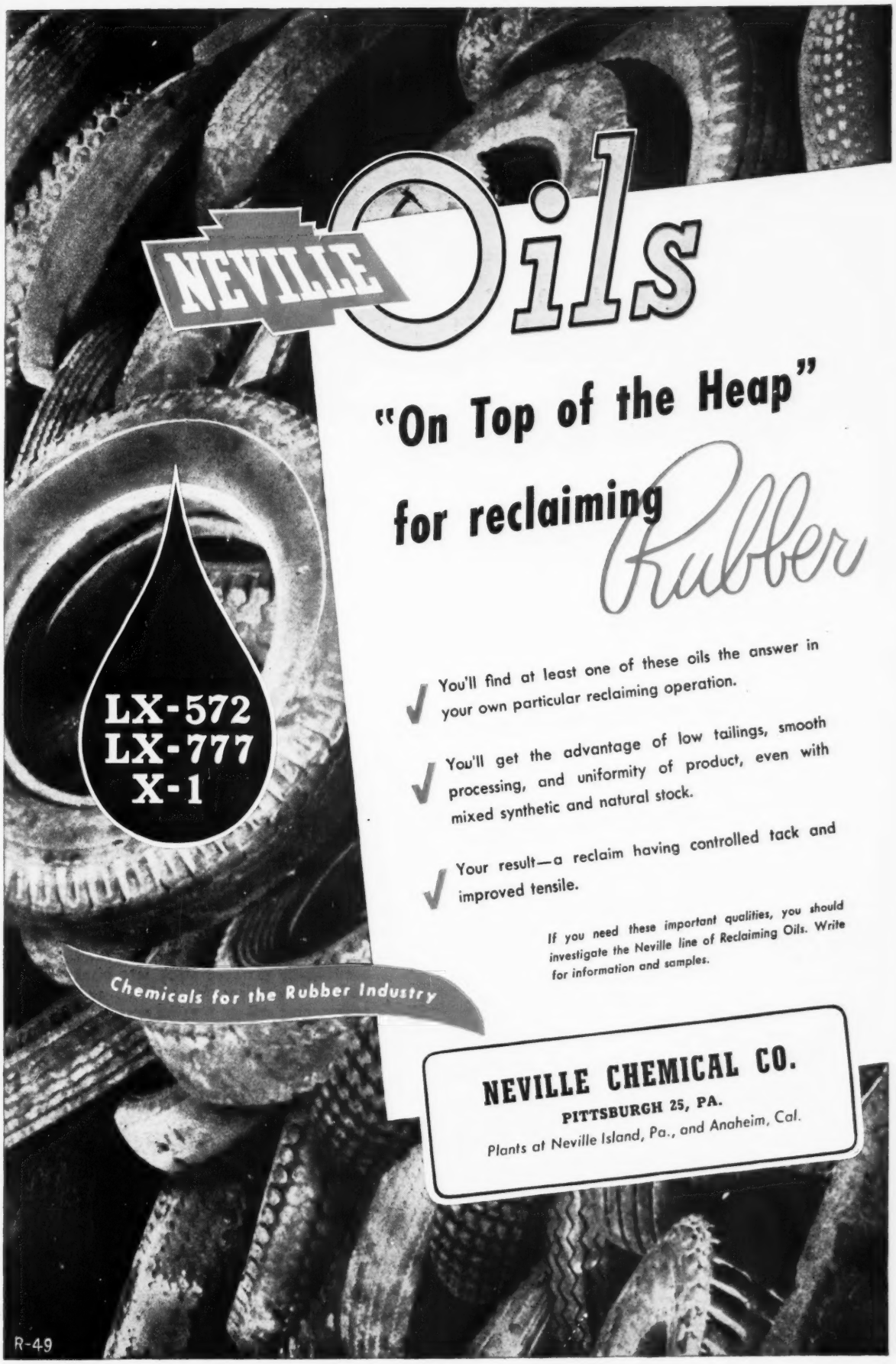
Wellington Sears

A SUBSIDIARY OF WEST POINT MANUFACTURING COMPANY

FIRST In Fabrics For Industry

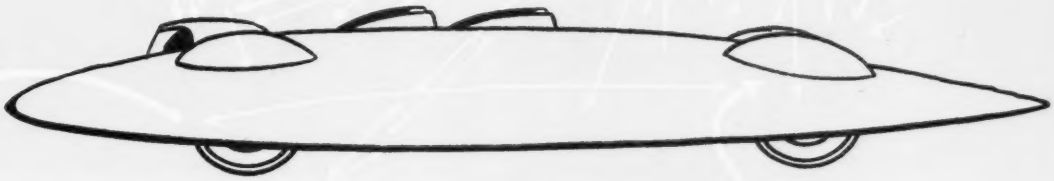
WELLINGTON SEARS COMPANY, 65 WORTH STREET, NEW YORK 13, N. Y.

OFFICES IN: ATLANTA • BOSTON • CHICAGO • DETROIT • LOS ANGELES • NEW ORLEANS • PHILADELPHIA • SAN FRANCISCO • ST. LOUIS


NEVILLE Oils
"On Top of the Heap"
for reclaiming Rubber
LX-572
LX-777
X-1
You'll find at least one of these oils the answer in your own particular reclaiming operation.
You'll get the advantage of low tailings, smooth processing, and uniformity of product, even with mixed synthetic and natural stock.
Your result—a reclaim having controlled tack and improved tensile.
If you need these important qualities, you should investigate the Neville line of Reclaiming Oils. Write for information and samples.
Chemicals for the Rubber Industry
NEVILLE CHEMICAL CO.
PITTSBURGH 25, PA.
Plants at Neville Island, Pa., and Anaheim, Cal.
R-49

How long did it take to get from here

to here?



Answer:
Forty-three years.

From the perky, wire-wheeled Stevens-Duryea Skeleton which whizzed around the track at Dayton, to the low-slung, torpedo-shaped Railton of John Cobb, there is an entire history of automobile development.

Partner in this development is Monsanto with its group of rubber chemicals, which have done—and are still doing—so much to improve tires and other rubber products.

One of these products is Monsanto's Insoluble Sulfur 60, which offers an economical and convenient way to use insoluble sulfur when such is indicated in the compound.

For more information on this and other products, write today for your copy of new catalog "Chemicals for the Rubber Industry," to MONSANTO CHEMICAL COMPANY, Rubber Service Department, 920 Brown Street, Akron 11, Ohio.

MONSANTO
CHEMICALS – PLASTICS

SERVING INDUSTRY...
WHICH SERVES MANKIND

MONSANTO CHEMICALS FOR THE RUBBER INDUSTRY

ANTIOXIDANTS
Flectol* H
Santoflex* B
Santoflex BX
Santoflex 35
Santoflex AW
Santowhite* Crystals
Santowhite MK
Santowhite L
Santowhite Powder

ALDEHYDE AMINE ACCELERATORS
A-32
A-100

MERCAPTO ACCELERATORS
Santocure*
El-Sixty*
Mertax (Purified Thiotax)
Thiotax (2-Mercapto benzothiazole)
Thiofide* (2,2' dithio-bis benzothiazole)

GUANIDINE ACCELERATORS
Diphenylguanidine (D.P.G.)
Guantal*

ULTRA ACCELERATORS FOR LATEX, ETC.
R-2 Crystals
RZ-50
RZ-50-B
Pip-Pip
Thiurad* (Tetramethyl-thiuram disulfide)
Ethyl Thiurad (Tetraethyl-thiuram disulfide)
Mono Thiurad (Tetramethyl-thiuram monosulfide)
Methasan* (Zinc salt of dimethyl dithiocarbamic acid)
Ethasan* (Zinc salt of diethyl dithiocarbamic acid)
Butasan* (Zinc salt of dibutyl dithiocarbamic acid)

PLASTICIZERS
DOP
Dibutyl Phthalate
Tricresyl Phosphate
Dioctyl Adipate
Santicizer* Plasticizers

SPECIAL MATERIALS
Thiocarbanilide ("A-1")
Santovar*-A
Santovar-O
Sulfasan R
Insoluble Sulfur "60"

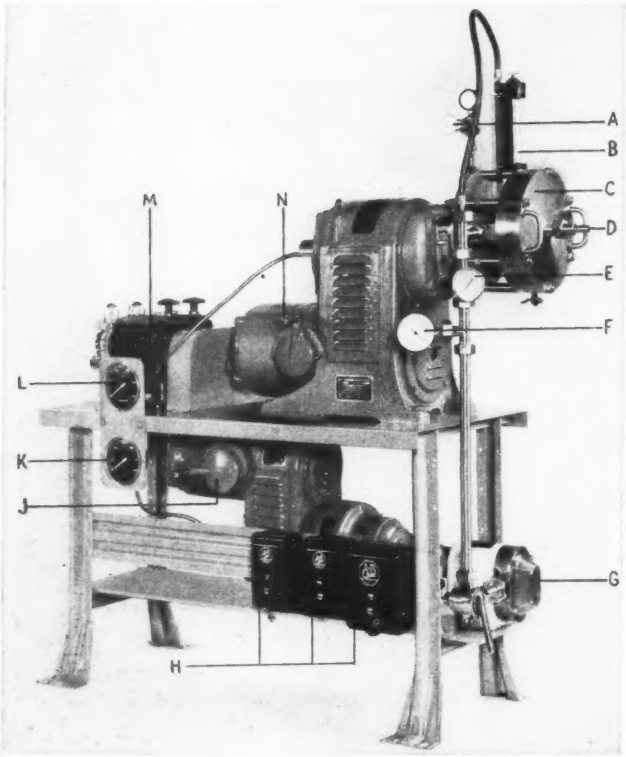
COLORS

REODORANTS

*Reg. U. S. Pat. Off.

THE FOAM RUBBER MIXER

everyone is buying!



● The mixing of foam rubber has, in the last six years, been revolutionized to such an extent by the Oakes Continuous Automatic Mixer that this equipment is now in use in plants in almost every country in the world where foam rubber is made. Mixing is quick, clean, continuous and under push-button control at all times. Production can be had in any volume from 50 to 1800 pounds of wet latex per hour at less cost and correspondingly larger profit. The product is of superlative quality—much superior to anything possible with batch mixers. Less investment is required for foaming equipment. Any density as low as .06 specific gravity can be obtained and held uniformly. There is much less scrap or waste. Loss of latex is reduced to less than 2 percent. Saving in labor is substantial. Foam is more stable. Injection molding is made possible. In short, this equipment will give you competitive advantages not otherwise obtainable. The mixer shown is our smaller model. There also is a larger model.

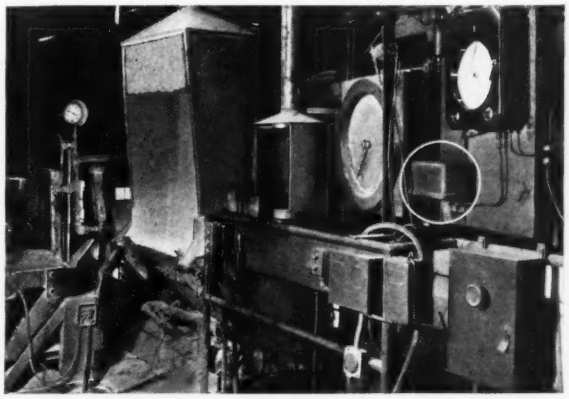
A. Air Pressure Regulating Valve
B. Air Flowmeter
C. Mixing Head
D. Discharge Hose Connection
E. Product Thermometer
F. Pressure Gauge
G. Latex Pump
H. Starting Boxes
J. Pump Speed Regulator
K. Pump Tachometer
L. Mixer Speed Tachometer
M. Chemical Proportioning Pumps
N. Mixer Speed Regulator

THE E. T. OAKES CORPORATION

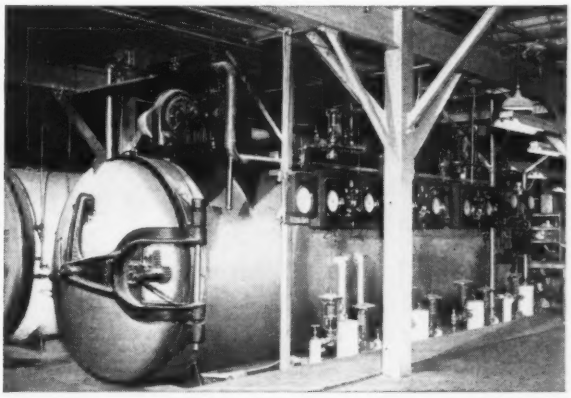
COMMACK ROAD, ISLIP, L. I., NEW YORK

Who controls the RUBBER INDUSTRY ?

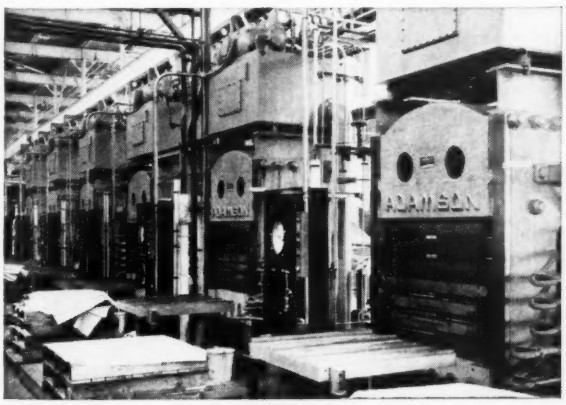
WHEN it comes to control of the various processes involved in the production of the finished article, Taylor instruments play an important role. From the accurate measurement and control of the mix in a Banbury, to the fully automatic control of modern tire presses, there are Taylor systems designed to save you money; help maintain product quality. Call your Taylor Field Engineer. Or write Taylor Instrument Companies, Rochester, N.Y.; Toronto, Canada.



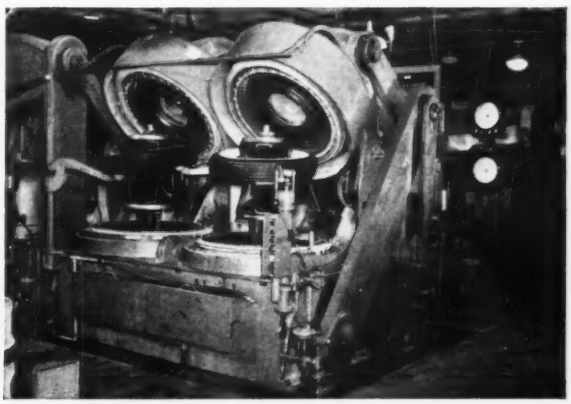
On this Banbury mixer the rugged yet highly responsive measuring system of the TRANSAIRE* Temperature Transmitter (circled) compensates for the poor heat transfer of the mix. The FULSCOPE* Controller accurately records and controls the time and temperature of each batch. Cuts out heat deterioration worries—and risk of fire.



A Taylor control system masterminds the operation of these boot and shoe vulcanizers. Steam temperature to the heating coils and air pressure inside the vulcanizers are both controlled, while the system automatically times the cycle, shuts off the air and vents the vulcanizer.

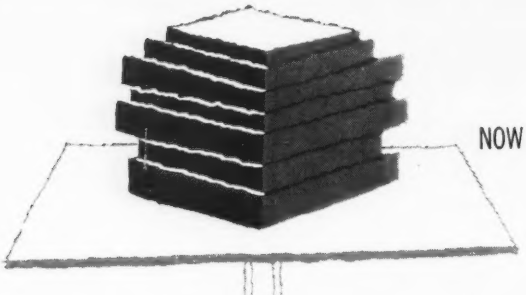


Taylor controls the entire operation of these multi-platen presses, from closing to opening. In addition, steam pressures are automatically regulated and recorded, condensate temperature is recorded—and condensate is disposed of at adjustable repeating intervals.



The sequence and duration of all the functions of this Bag-O-Matic Press are automatically controlled by Taylor instrumentation, from closing to opening of the press. This includes control of press temperature and condensate removal in each cavity, and the recording of bag pressure to each press.

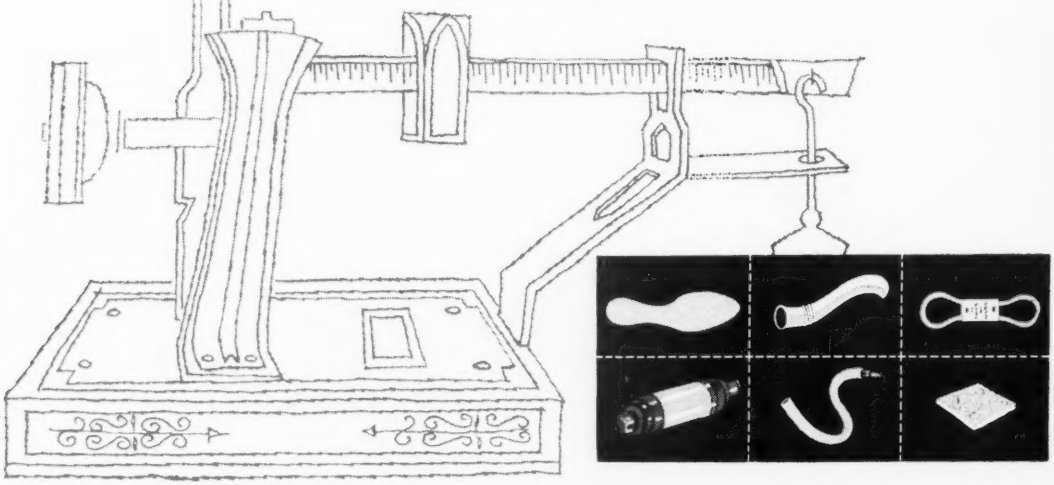
Taylor Instruments **MEAN ACCURACY FIRST**



NOW AVAILABLE IN TONNAGE QUANTITIES

INDULIN 70-GR-S

A LIGNIN-RUBBER COPRECIPITATE



INDULIN 70-GR-S, a coprecipitate of lignin and a butadiene-styrene copolymer, is now available in tonnage quantities from West Virginia. Its most promising applications are the manufacture of shoe soles, mechanical goods and rubber tile. INDULIN acts as a reinforcing agent and filler.

Among its advantages.

1. Excellent color plus good general properties when used in combination with white pigments.
2. High tear resistance.
3. Low specific gravity resulting in low volume cost.
4. Low modulus and high elongation in comparison with stocks of the same volume loadings.
5. Excellent flex life and low flex crack growth.

West Virginia has a wealth of information on the uses of INDULIN in rubber. For complete details, please address your request to:

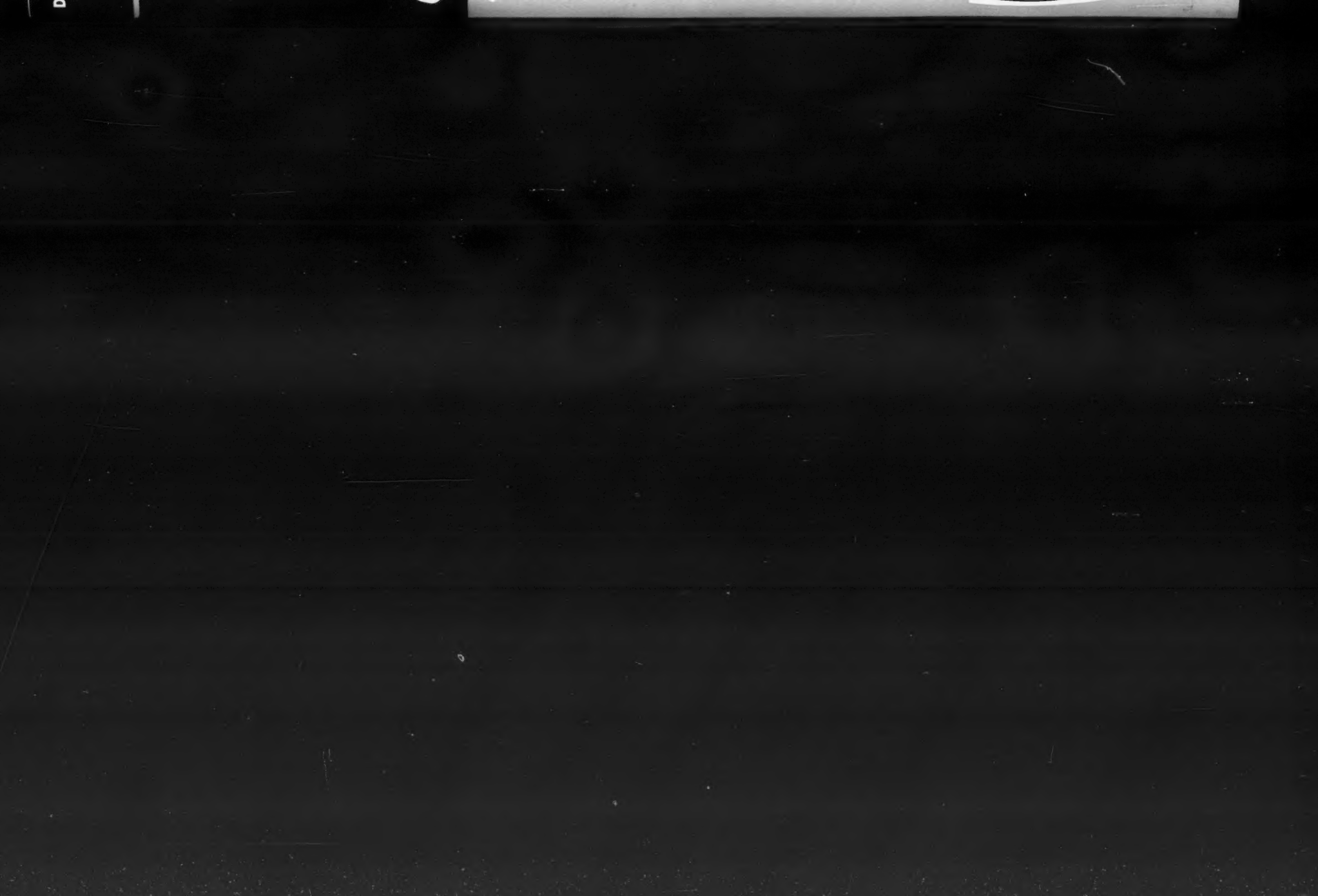
WEST VIRGINIA PULP AND PAPER COMPANY

POLYCHEMICALS DIVISION

CHARLESTON A, SOUTH CAROLINA

Y

WORLD



DOUBLE-CHECKED CHEMICALS
FOR THE RUBBER INDUSTRY

ETHYLAC

Gaining wide acceptance throughout the rubber industry . . .

This delayed action accelerator can be used to compound stocks with these characteristics:

1. Safe Processing
2. Excellent Mold Flow
3. Low Compression Set
4. Low Heat Build-Up

SHARPLES TRADE MARK CHEMICALS

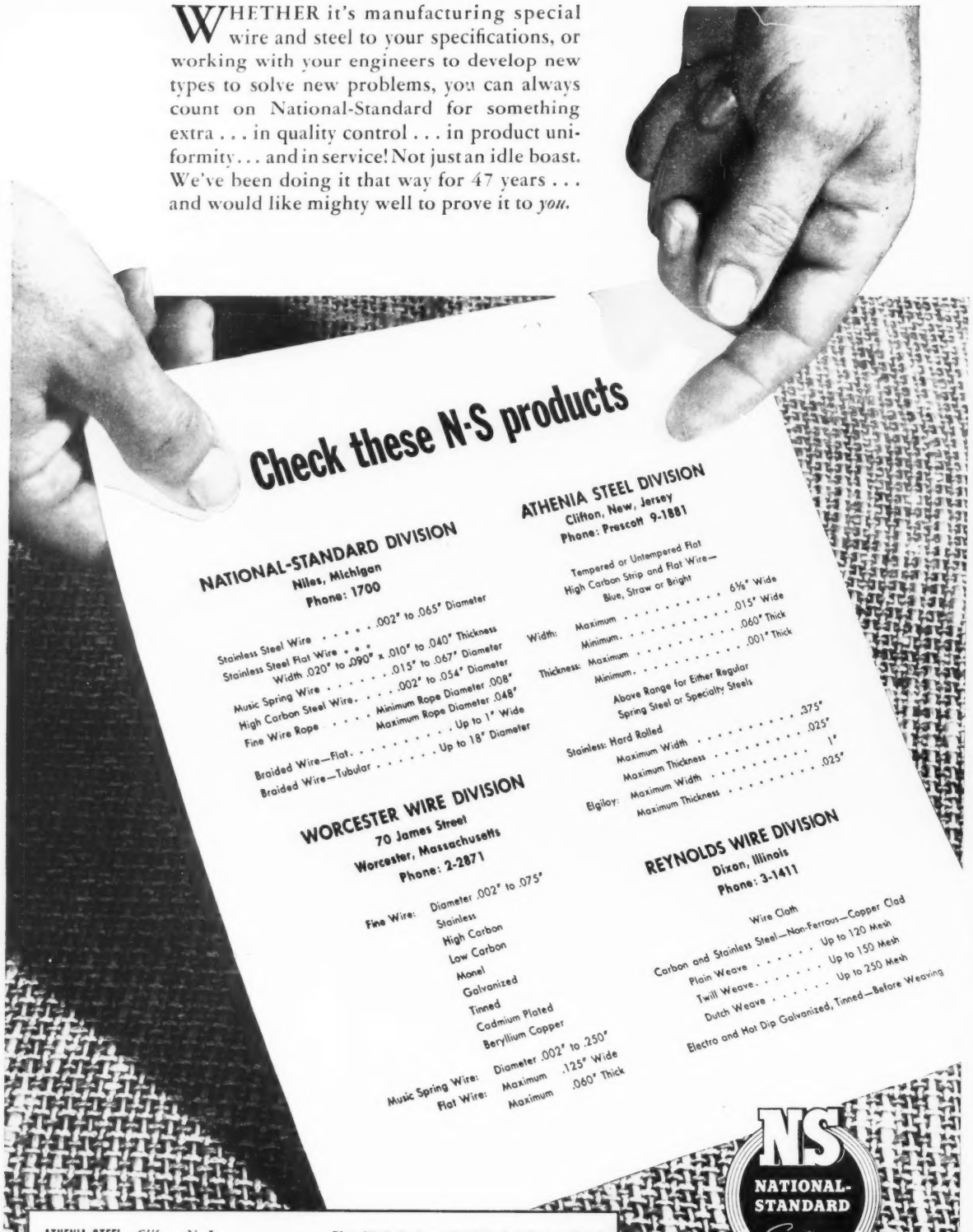
SHARPLES CHEMICALS INC.

A SUBSIDIARY OF THE PENNSYLVANIA SALT MANUFACTURING COMPANY

500 Fifth Ave., New York • 80 E. Jackson Boulevard, Chicago • 106 S. Main St., Akron
The Pennsylvania Salt Manufacturing Company of Washington:
Los Angeles • Tacoma • Berkeley • Portland
Shawinigan Chemicals, Ltd.: Montreal • Toronto
Airco Company International, New York

Need special-purpose wire or steel?

WHETHER it's manufacturing special wire and steel to your specifications, or working with your engineers to develop new types to solve new problems, you can always count on National-Standard for something extra . . . in quality control . . . in product uniformity . . . and in service! Not just an idle boast. We've been doing it that way for 47 years . . . and would like mighty well to prove it to *you*.



Check these N-S products

NATIONAL-STANDARD DIVISION
Niles, Michigan
Phone: 1700

Stainless Steel Wire . . . . . .002" to .065" Diameter
Stainless Steel Flat Wire . . . .
Width .020" to .090" x .010" to .040" Thickness
Music Spring Wire . . . . . .015" to .067" Diameter
High Carbon Steel Wire. . . . . .002" to .054" Diameter
Fine Wire Rope . . . . Minimum Rope Diameter .008"
Maximum Rope Diameter .048"
Braided Wire—Flat. . . . . Up to 1" Wide
Braided Wire—Tubular . . . . . Up to 18" Diameter

ATHENIA STEEL DIVISION
Clifton, New Jersey
Phone: Prescott 9-1881

Tempered or Untempered Flat High Carbon Strip and Flat Wire—Blue, Straw or Bright

Width: Maximum . . . . . 6⅛" Wide
Minimum. . . . . .015" Wide
Thickness: Maximum . . . . . .060" Thick
Minimum . . . . . .001" Thick

Above Range for Either Regular Spring Steel or Specialty Steels

Stainless: Hard Rolled . . . . . .375"
Maximum Width . . . . . .025"
Maximum Thickness . . . . . 1"
Elgiloy: Maximum Width . . . . . .025"
Maximum Thickness . . . . . .025"

WORCESTER WIRE DIVISION
70 James Street
Worcester, Massachusetts
Phone: 2-2871

Fine Wire: Diameter .002" to .075"
Stainless
High Carbon
Low Carbon
Monel
Galvanized
Tinned
Cadmium Plated
Beryllium Copper

Music Spring Wire: Diameter .002" to .250"
Flat Wire: Maximum .125" Wide
Maximum .060" Thick

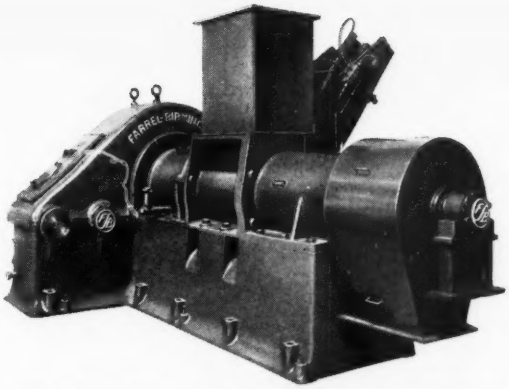
REYNOLDS WIRE DIVISION
Dixon, Illinois
Phone: 3-1411

Wire Cloth
Carbon and Stainless Steel—Non-Ferrous—Copper Clad
Plain Weave . . . . . Up to 120 Mesh
Twill Weave. . . . . Up to 150 Mesh
Dutch Weave . . . . . Up to 250 Mesh
Electro and Hot Dip Galvanized, Tinned—Before Weaving

NS NATIONAL-STANDARD Company NILES, MICHIGAN

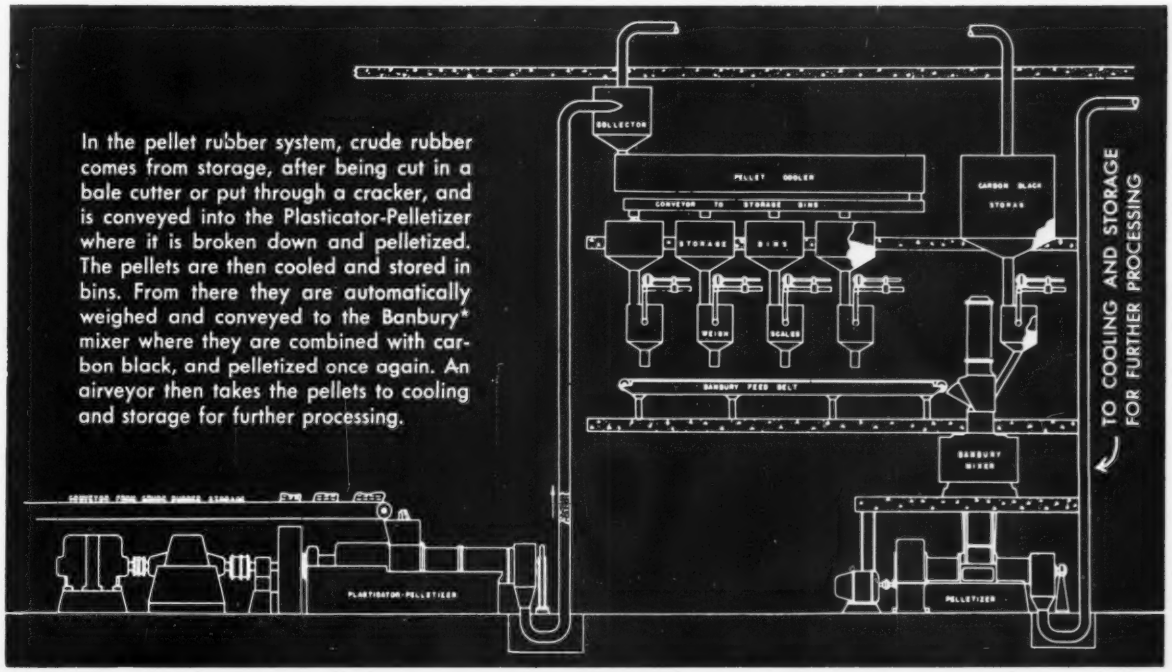
ATHENIA STEEL..*Clifton, N. J.*.....Flat, High Carbon, Cold Rolled Spring Steel
NATIONAL-STANDARD..*Niles, Mich.*.....Tire Wire, Stainless, Fabricated Braids and Tape
REYNOLDS WIRE..*Dixon, Illinois*.....Industrial Wire Cloth
WAGNER LITHO MACHINERY..*Jersey City, N. J.*.....Metal Decorating Equipment
WORCESTER WIRE WORKS..*Worcester, Mass.*.....Round and Shaped Steel Wire, Small Sizes

DIVISIONS OF NATIONAL-STANDARD CO.
NILES, MICHIGAN



modernize

WITH THE PELLET RUBBER SYSTEM



By transforming bulky, hard-to-handle rubber into free-flowing pellets, the Pelletizer makes possible modern, high-efficiency mill systems, like the one shown here. Automatic conveying, weighing and mixing cut handling and storage costs. Overhead storage and elimination of trucking reduces required floor space. The mill room is cleaner because the pellet handling system is completely sealed in.

Other advantages you get from the pellet rubber system are:

1 Increased production—Banbury* mixing cycle reduced.

2 Greater ease of mixing and blending rubber pellets improves uniformity and quality of finished product.

3 Pellets cooled quicker, more thoroughly—reduces time between processing operations—less stock in process.

The Pelletizer itself is an extruding machine in which a screw forces the rubber up to the pelletizing head, where the pellets are formed. The pellets are lightly coated, before leaving the machine, with a soapstone solution which prevents sticking together. Besides pelletizing, this machine gives the rubber extra working, which improves plasticity and dispersion.

If you are interested in improving uniformity and quality of your finished product, and at the same time cutting your handling costs send for complete information about the Pelletizer and the pellet rubber system. Write today—no obligation, of course.

FARREL-BIRMINGHAM COMPANY, INC., ANSONIA, CONN.

Plants: Ansonia and Derby, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Akron, Chicago, Los Angeles, Houston

*Trade-mark FB-913

Farrel-Birmingham®

For Rubber Compounding Use VELSICOL RESINS

NOW AVAILABLE IN VARYING MELTING-POINT RANGES AND COLORED GRADES

SOME SUGGESTED APPLICATIONS:

- Mechanical Goods
- Electrical Insulation Compounds
- Rubber Shoe Soles and Heels
- Rubber Floor Tiling
- Gaskets and Jar Rings
- Rubber Adhesives and Cements
- Molded Rubber Products
- Tubular Compounds
- Reclaimed Rubber Sheeting
- Colored Rubber Stocks
- Battery Cases
- Hard Rubber Compounds

FEATURES:

1 THERMOPLASTIC HYDROCARBON RESINS.

2 COMPATIBLE WITH NATURAL AND SYNTHETIC RUBBERS.

3 EFFECTIVE PLASTICIZERS AND SOFTENERS . . . in highly-loaded clay stocks or in recipes incorporating carbon black.

4 MILL READILY.

5 EXCELLENT DISPERSING AGENTS FOR FILLERS AND PIGMENTS.

6 FACILITATE PROCESSING PROCEDURES . . . impart excellent milling, calendering processing and tubing characteristics to stocks.

7 IMPART EXCELLENT PERFORMANCE CHARACTERISTICS . . . such as good tensile strength, elongation and modulus, as well as good resistance to abrasion and aging.

8 POSSESS HIGH ELECTRICAL RESISTANCE PROPERTIES.

9 AID IN THE DEVELOPMENT OF NON-SCORCHY STOCKS . . . without excessive retardation of cure at high temperatures.

For additional information concerning properties and applications of Velsicol Resins, WRITE:

VELSICOL CORPORATION

General Offices and Laboratories
330 East Grand Avenue, Chicago 11, Illinois

Export Division
100 East 42nd Street, New York 17, New York

REPRESENTATIVES IN PRINCIPAL CITIES

PETROLEUM DERIVED CHEMICALS — VELSICOL — SERVING BASIC INDUSTRIES

COLORED BUTYL RUBBER COMPOUNDS

RECIPES

	A	B	C
GR-I 15 (Butyl Rubber)	100	100	100
Zinc Oxide	5	5	5
Hi-Sil® 202	39	58.5	40
Calcene® NC	.....	.....	40
Soft Clay	.....	.....	40
TMTDS	2	2	2
Sulfur	1	1	1
Sulfasan®	1	1	1
Paraffin	0.75	0.75	0.75
Diethylene Glycol	1.5	1.5	1.5
BxDC	1	1	1
Color and TiO_2	As Required		

PHYSICAL PROPERTIES

Mins. Cure at 320° F.	Modulus 300%	Modulus 500%	Tensile	Elong.	Hardness 0″	Hardness 30″	Crescent Tear
COMPOUND A							
7.5	180	530	2650	800	59	45	270
10	180	550	2550	780	62	47	270
15	210	680	2580	760	63	49	270
20	230	700	2510	730	66	50	250
30	240	670	2540	740	66	50	240
COMPOUND B							
7.5	180	470	2240	910	70	57	380
10	200	610	2240	860	72	62	350
15	260	700	2240	810	74	62	350
20	290	750	2240	800	76	66	310
30	340	950	2080	720	77	67	300
COMPOUND C							
7.5	280	680	1690	760	76	57	300
10	300	680	1650	720	76	60	290
15	340	870	1740	700	77	61	270
20	330	810	1530	670	82	63	240
30	380	890	1570	660	82	62	260

At last!

COLORED BUTYL COMPOUNDS POSSESSING GOOD PHYSICAL PROPERTIES

HI-SIL 202

With Hi-Sil 202, it is now possible to make good white or colored butyl compounds.

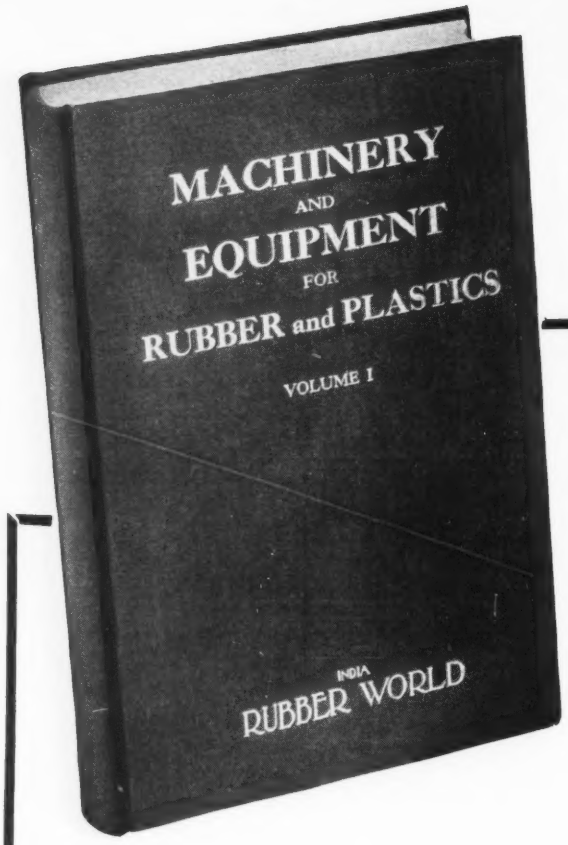
In addition to excellent physical properties, Hi-Sil 202 provides cures without subsequent sulfur bloom by use of an improvement in compounding shown in the listed formulation.

This application of Hi-Sil 202 opens up broad new opportunities to utilize the sales advantages of attractive bright or pastel colors in molded goods or extruded parts.

Write today to our Pittsburgh office for further information on Hi-Sil 202, or for experimental working samples.

COLUMBIA-SOUTHERN CHEMICAL CORPORATION
SUBSIDIARY OF PITTSBURGH PLATE GLASS COMPANY
ONE GATEWAY CENTER · PITTSBURGH 22 · PENNSYLVANIA

DISTRICT OFFICES: Cincinnati · Charlotte
Chicago · Cleveland · Boston · New York
St. Louis · Minneapolis · New Orleans
Dallas · Houston · Pittsburgh · Philadelphia
San Francisco



More than 73%
OF ORIGINAL ISSUE
Already Sold
• No reissue anticipated

This time and money-saving book was compiled by Robert G. Seaman and Arthur M. Merrill, editors of RUBBER WORLD, a publication with a background of 65 years of close contact with the men who have invented, improved, built, sold and used rubber machinery and equipment since 1889.

•

804 Pages; 341 Illustrations
Cloth Bound; 6 x 9 Inches

The only book of its kind

20 Complete Chapters, on Each of the Following Subjects

1. Mills
2. Mill Accessories
3. Mixers
4. Calenders & Accessories
5. Extruders
6. Extruder Accessories
7. Presses, Compression
8. Press Accessories
9. Presses, Injection
10. Molds & Mold Accessories
11. Web Coating & Handling Equipment
12. Pressure Vessels
13. Heaters, Dryers and Coolers
14. Tire & Tube Machinery
15. Hose & Belting Machinery
16. Footwear Machinery
17. Wire & Cable Machinery
18. Sole & Heel Machinery
19. Latex Machinery
20. Special Plastics Machinery

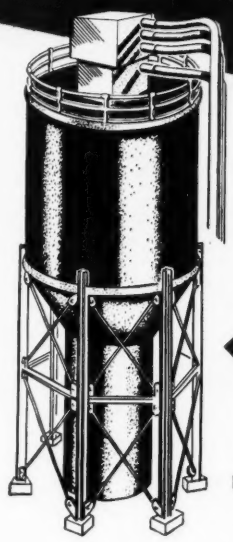
PLEASE FILL IN AND MAIL WITH REMITTANCE OR WE WILL BILL YOU
RUBBER WORLD, 386 Fourth Avenue, New York 16, N. Y.

Order for .... copies of "Machinery & Equipment for Rubber & Plastics."
$15. in U.S.A.
$16. Elsewhere

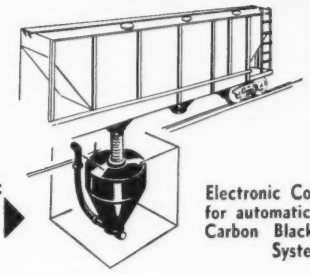
Name .....
Firm .....
Street .....
City .....

Your Plans to modernize Your Banburys should include...

THE KENNEDY *Completely Automatic* PNEUMATIC CARBON BLACK SYSTEM

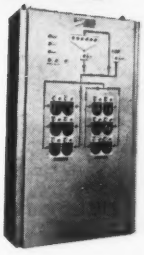


Primary Storage Silo



Kennedy Automatic Pneumatic Transport Pump

Electronic Control Panel for automatic control of Carbon Black Handling System



HERE'S WHY!

- Completely automatic operation of unloading bulk car, storing, selecting, distributing and weighing-out carbon blacks.
- Serve any number of Banburys from one central storage unit with any number of blacks. All blacks can be transported through same pipe without contamination.
- System is completely enclosed—revolutionizes plant housekeeping and improves efficiency by providing far cleaner working conditions.
- Transport lines of standard pipe eliminate the need for space-wasting trusses and other unsightly structures.
- Basic equipment has no high speed moving parts to wear and require frequent adjustment or replacement —maintenance is reduced to a minimum.
- System can be expanded for future requirements at minimum cost and least disturbance to existing plant.
- Kennedy Carbon Black feeders provide the ultimate in accurate proportioning of blacks to meet today's laboratory demands.
- The Kennedy System meets every Carbon Black requirement for automatic Banbury operation. Every installation backed by years of research and development, extensive production facilities and a large staff of qualified personnel.

Send for Bulletin 52-F describing the Kennedy PNEUMATIC Carbon Black Handling System.

LEARN TODAY

how the KENNEDY completely automatic Carbon Black System can be fitted into your plans.

KENNEDY-VAN SAUN

MANUFACTURING & ENGINEERING CORPORATION

TWO PARK AVENUE, NEW YORK

***FACTORY* DANVILLE, PA.**

CABOT CUSTOMER SERVICE

is personalized service

WORKING TOGETHER, *Technically trained and experienced Cabot laboratory and sales representatives become valuable members of* **YOUR** *staff . . .*

. . . Designed to solve the specific problems which you as an individual company encounter in vinyl plastics manufacture

- **Cabflex® Di-OP** *di-iso-octyl phthalate*
- **Cabflex® ODP** *iso-octyl decyl phthalate*
- **Cabflex® DDP** *di-decyl phthalate*
- **Cabflex® DOCP** *iso-octyl capryl phthalate*
- **Cabflex Di-OA®** *di-iso-octyl adipate*
- **Cabflex® ODA** *iso-octyl decyl adipate*
- **Cabflex® DDA** *di-decyl adipate*
- **Cabflex® Di-OZ** *di-iso-octyl azelate*
- **Cabflex Di-BA®** *di-iso-butyl adipate*
- **Cabol 100** *hydrocarbon oil plasticizer*

There is no patterned procedure . . . only one general rule . . . to give you complete satisfaction . . . with product, with company . . . with Cabot service.

Our technical sales representatives are thoroughly trained and experienced to give the right answers. When the answers require research, Cabot laboratory experts are equipped to find the right answers. Company facilities are extensive and modern, offering the best possible assistance in meeting your individual specifications.

Cabot service will always be personalized service . . . as it has been since 1882.

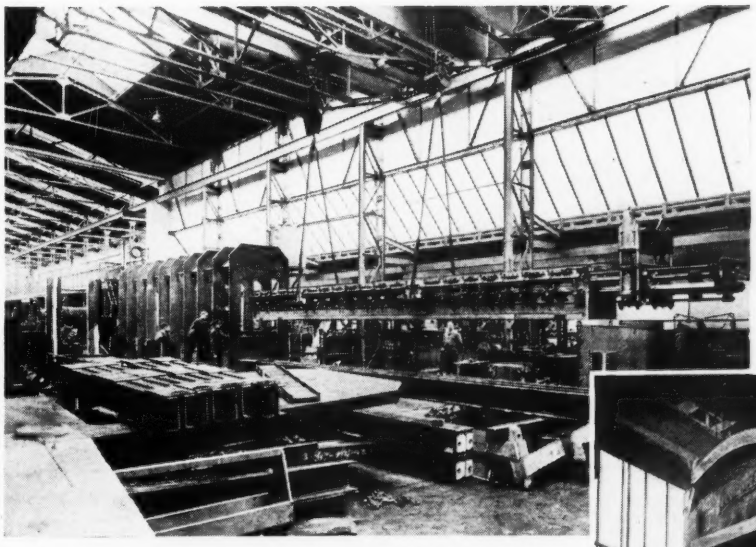
AT YOUR PLANT... AT OUR LABORATORIES... IN OUR OFFICES... LET CABOT BE OF SERVICE TO YOU

Send for samples, technical information and prices

CABOT PLASTICS CHEMICALS DIVISION

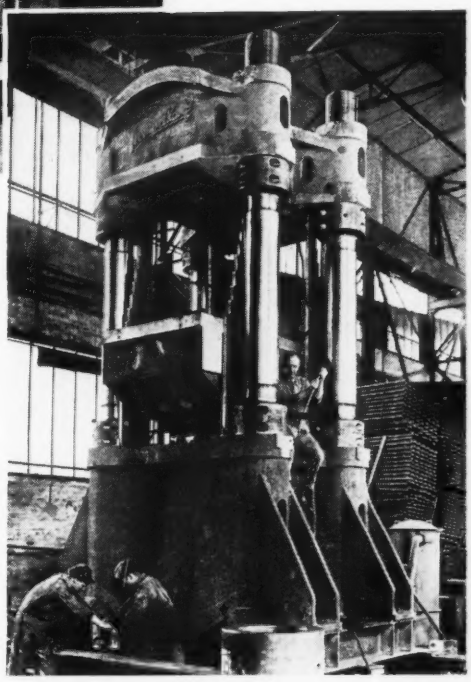
GODFREY L. CABOT, INC.
77 Franklin St., Boston 10, Mass.

Siempelkamp



Assembling
Belt Press

One of the many
Hydraulic Presses
built to specifications



Siempelkamp builds Hydraulic Presses of all types to specifications. Established in 1883 Siempelkamp has acquired the "know how" to make the finest in machinery at the lowest cost.

Write today for quotations F.O.B. New York City. Direct credit arrangement to well-rated companies.

Exclusive Representative in U.S.A. to the Rubber and Plastics Industries:

WILLIAM TAPPER

30 SOUTH BROADWAY YONKERS, NEW YORK

Phone: YOnkers 3-7455 **Cable: WILTAPPER**

All Other Inquiries—Send Direct to:

G. SIEMPELKAMP & CO. KREFELD, WEST GERMANY

Telex 0853 811 Cable: SIEMPELKAMPCO

rk-

ost
nt,
.6
's
ed
ti-
ut
ers

-7"

ORLD

A

AN
CIA
WH
TIO

Just
ANT

SALE
STOC
• H.
Inc.,
Comp
Chica
Comp

A Significant New Achievement of Cyanamid Research

ANTIOXIDANT 425*

. . . another antioxidant with excellent resistance to aging. Provides the best protection against discoloration and staining of any antioxidant yet produced.

ANTIOXIDANT 425 HAS BEEN ESPECIALLY DEVELOPED FOR PRODUCTS WHERE EVEN MINIMUM DISCOLORATION CANNOT BE TOLERATED.

Just published: Technical Bulletin on ANTIOXIDANT 425 — send for it today!

*Trade-mark

SALES REPRESENTATIVES AND WAREHOUSE STOCKS: Akron Chemical Company, Akron, Ohio • H. M. Royal, Inc., Trenton, N. J. • H. M. Royal, Inc., Los Angeles, Calif. • Ernest Jacoby and Company, Boston, Mass. • Herron & Meyer of Chicago, Ill. • In Canada: St. Lawrence Chemical Company, Ltd., Montreal and Toronto

Calco®

AMERICAN Cyanamid COMPANY

INTERMEDIATE & RUBBER CHEMICALS DEPARTMENT

BOUND BROOK, NEW JERSEY

DRAPEX 3.2

LOW TEMPERATURE EPOXY PLASTICIZER

EXCELLENT *low* TEMPERATURE FLEXIBILITY AT *low* COST

At a fraction of the cost, Drapex 3.2 gives your vinyls low temperature flexibility properties equivalent to dioctyl sebacate. Its low volatility and low specific gravity (.905 at 20 C.) are additional economy features.

In addition, Drapex 3.2, because of its epoxy content, offers excellent stability . . . high heat resistance, low extractability, and resistance to water and sunlight.

LOW VISCOSITY PLASTISOLS USING 25% *less* PLASTICIZER

Tests indicate that a plasticizer consisting of two-thirds dioctyl phthalate and one-third Drapex 3.2 gives the plastisol formulation the same viscosity as when dioctyl phthalate is used alone . . . but, requires 25% less plasticizer. By using Drapex 3.2, you use less plasticizer to get the same viscosity, and at the same time, obtain a wider range of flexibility.

These 2 big advantages of Drapex 3.2 will improve the quality of your products while saving money. Why not find out how Drapex 3.2 can work for you. *Write today for Technical Bulletin 4, a working sample, and the low price of Drapex 3.2.*

"PURR-FECTION"

ARGUS CHEMICAL CORPORATION

633 COURT STREET BROOKLYN 31, N. Y.

ALCOGUM AN-10

(SODIUM POLYACRYLATE)

Serves the latex compounding industry both as stabilizer and thickener.

ALCOGUM AN-10 is a 10% solution, having a pH of 10. Provides more effective viscosity control of compounds even during prolonged storage, and greater dilutability through adequate stabilization.

Distributors for Firestone Liberian Latex.

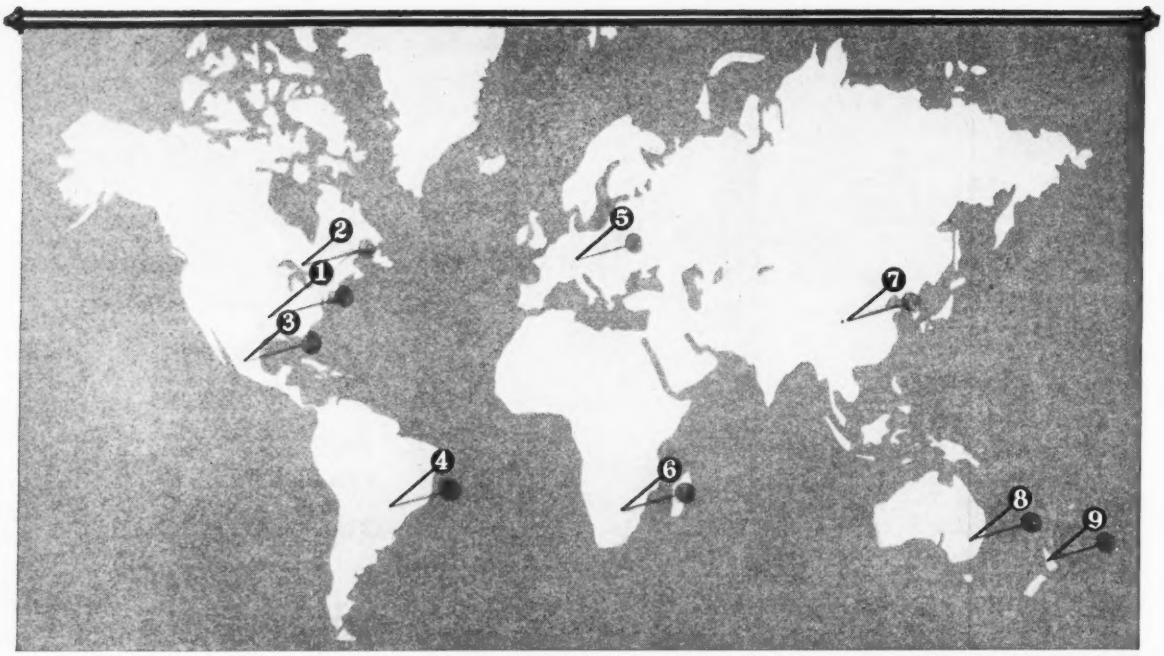
●

Our sales and technical staffs are at your disposal.

ALCO OIL & CHEMICAL CORPORATION

TRENTON AVE. and WILLIAM ST., PHILADELPHIA 34, PA.

NEW ENGLAND OFFICE
Alco Oil & Chemical Corp.
610 Industrial Trust Bldg.
111 Westminster St., Providence 3, R.I.
Phone: ELmhurst 1-4559



HUBER distributors serve rubber industry the world over

1 NORTH AMERICA

UNITED STATES

Midwest
Akron Chemical Co.
255 Fountain St., Akron 4, Ohio

Minnesota
Lyon Chemicals, Inc.
2305 Hampden Avenue, St. Paul 4

New England
W. D. Egleston Co.
249 5th St., Cambridge 42, Mass.

New Jersey, Eastern Pa.
H. M. Royal, Inc.
689 Pennington Ave., Trenton 1, N. J.

Pacific Coast
H. M. Royal, Inc.
4814 Loma Vista Ave., Los Angeles 58, Cal.

Chicago
J. M. Huber Corporation
59 East Van Buren Street

2

CANADA
Charles Tennant & Company (Canada) Ltd.
96 Bloor Street West, Toronto 5, Ontario
Charles Tennant & Company (Canada) Ltd.
440 Canada Cement Building, Montreal 2, P. Q.

3

MEXICO
Mr. Miguel S. Morales
San Juan De Letran 72, Mexico, D. F.

4 SOUTH AMERICA

ARGENTINA
Williams Quimica y Tecnica S. de R. L.
Belgrano 1666/70, Buenos Aires

BRAZIL
Tennant Importacao e Exportacao Ltda.
4, Avenida Rio Branco, (Salas 1407/9)
Rio de Janeiro

CHILE
Foram Chilena Ltda.
Casilla 2796, Santiago

COLOMBIA
Arnaldo Buch
Apartado Aereo 4074, Bogota

PERU
Tennant (Peru) S. A.
Edificio del Castillo
Av. Nicolas de Pierola 611, Lima

URUGUAY
Pedro Barfod e Hijos
Paysandu 941, Montevideo

VENEZUELA
Distribuidora Par S. A.
P. O. B. 1834
Caracas

5 EUROPE

AUSTRIA
Hans Lach
Grailechgasse 3, Vienna 3

BELGIUM
Sepulchre Freres & Co.
1 Quai Marcellis, Liege (Carbon Blacks)
Compagnie Anversoise
de Produits Chimiques
21 Kipdorp, Antwerp (Clays)

FINLAND
Max Aue
Skillnadsg 5, Helsinki

FRANCE
Etablissements G. Devineau
26 Rue Lafayette, Paris 9

GERMANY
Lehmann & Voss
Alsterufer 19, Hamburg 36

HOLLAND
Goudeket & Co.
O. Z. Voorburgwal 151, Amsterdam C

ITALY
Umberto Demeglio
94 Via Massena (412), Turin

NORWAY
Carl B. Prosch
Prinsengate 7, Oslo

PORTUGAL
Sociedade Tecnica de Representacoes, Lda.
Rua dos Bacalhoeiros 99, 2.o
Lisbon

SPAIN
Brandau y Cia. S. L.
Juan Bravo 20, Madrid

SWEDEN
Henrik Genberg
Gothenburg

SWITZERLAND
Sugro Ltd.
P. O. Box, Basle 2

UNITED KINGDOM
J. M. Huber, Ltd.
143 Cannon Street, London E. C. 4

6 AFRICA

SOUTH AFRICA
Carst & Walker Pty., Ltd.
P. O. Box 1193, Durban

7 ASIA

BRITISH MALAYA & INDONESIA
Rotterdam Trading Co.
Singapore
N. V. Internationale, Credito-en-Handels,
Vereeninging "Rotterdam,"
Batavia (Jakarta)

INDIA
Satish C. Anand
Plastic Chemicals Company
Elphinstone Building
Churchgate St., Bombay

ISRAEL
Hirshberg Bros. & Co. Chemicals Ltd.
39 Wolfson St.
Tel-Aviv

JAPAN
American Trading Company, Inc.
96 Wall Street, New York 5, N. Y.
American Trading Company of Japan, Ltd.
Kobe
American Trading Company of Japan, Ltd.
Tokyo

TURKEY
Moiz Baruh, Y. Zara Company
Aynali Lokanta, Sek. 21
P. O. Box 1811, Istanbul

8 AUSTRALIA

Whitney & Oettler
P. O. Box 155, Savannah, Georgia
Sub Agent:
A. H. Pearce
Challis House, Martin Place
Sydney

R. A. Christian
Arnold House, 14 Queen St.
Melbourne C1

9 NEW ZEALAND

Gollin & Co., Pty., Ltd.
G. P. O. Box 794, Wellington, C.1

J. M. HUBER CORPORATION, 100 PARK AVENUE, NEW YORK 17, N. Y.

CARBON BLACKS, CLAYS, RUBBER CHEMICALS

RUBBER WORLD

A Bill Brothers Publication

Formerly

INDIA RUBBER WORLD

JULY, 1954

Vol. 130—No. 4

NBP EPA

SUBSCRIPTION PRICES

United States, $5.00 per year; Canada, $6.00; all other countries, $7.00. Single copies in the U. S., 50¢; elsewhere, 60¢.

Other Bill Publications are: In Marketing, SALES MANAGEMENT, SALES MEETINGS, PREMIUM PRACTICE. In Merchandising, FLOOR COVERING PROFITS, FOUNTAIN & FAST FOOD, GROCER-GRAPHIC, TIRES — TBA Merchandising, YANKEE FOOD MERCHANT.

Table of Contents

Departments

Market Reviews

Statistics

RUBBER WORLD assumes no responsibility for the statements and opinions advanced by contributors.

A BILL BROTHERS PUBLICATION

Published monthly by

BILL BROTHERS PUBLISHING CORPORATION

Editorial and Executive
386 Fourth Ave.,
New York 16, N. Y.
LExington 2-1760

Office of Publication
1309 Noble St.,
Philadelphia 23,
Pennsylvania

Chicago Office: 333 N. Michigan Ave.
STate 2-1266

B. BRITTAIN WILSON, *General Manager*
ROBERT G. SEAMAN, *Editor*
S. R. HAGUE, *Managing Editor*
ARTHUR M. MERRILL, *Associate Editor*
ROBERT C. TOTH, *Editorial Assistant*
RUFUS H. FAIRCHILD, *Advertising Manager*
M. J. McCARTHY, *Circulation Manager*
M. A. LARSON, *Production Manager*

Chairman of Board and Treasurer
RAYMOND BILL

Vice Presidents
B. BRITTAIN WILSON
C. ERNEST LOVEJOY
WM. H. McCLEARY

President and General Manager
EDWARD LYMAN BILL

RUBBER WORLD
VOL. 130—NO. 4 JULY, 1954

Editorials

Natural Rubber Now Appears to Be on the Right Road

VERY great significance can and should be attached to certain statements made at the May meeting of the International Rubber Study Group in Colombo, Ceylon, regarding actions the natural rubber industry is planning to take to strengthen the competitive position of its product. After years of emphasis on a policy of restriction and regulation of production in order to maintain the market and price for natural rubber, the producers now consider most important, "replanting or new planting with high yielding material; intensification of production research . . . and, *on the side of research into consumption and development of new uses, a closer liaison between those engaged therein and the consuming manufacturers.*" [Italics ours—EDITOR.]

The above-quoted material is from the Final Press Communiqué of May 12, 1954.

A report of the IRSG Development Committee to the Group at the same time is even more specific in recommending discussions with representatives of manufacturers of major consuming countries to consider: "(1) Whether programs of consumption research and development should be modified to fit more closely with manufacturers' requirements in consuming countries, and (2) Improvement of liaison, where necessary, with manufacturers concerning research and development."

It was pointed out on this page in November, 1952, that as soon as private industry took over the synthetic plants in this country, synthetic rubber would then really be sold and serviced in the same manner as other chemical products. We emphasized further at that time:

"Either the producers and/or dealers in the United States will then have to provide the same kind of selling and service for natural rubber, or their volume of business will suffer materially."

We think the natural rubber industry has decided to take the right fork in the road.

PLASTICS TECHNOLOGY—A New Publication!

IN AUGUST, 1945, the "Plastics Technology" department was initiated in RUBBER WORLD because the then-current trend in the rubber industry indicated a need of regular and organized technical information on plastics.

The editors and publisher of RUBBER WORLD have now decided to make the "Plastics Technology" department a separate monthly publication beginning in September, 1954, because of the rapid growth of the plastics industry in recent years and the lack of centralized published information. The new publication will have the same name as the former department and will be known as PLASTICS TECHNOLOGY. Further details on this new publication, which was first announced at the Plastics Conference and Exposition of The Society for the Plastics Industry in Cleveland, O., during the week of June 7, will be found elsewhere in this issue.

Although there is considerable overlapping in the activities and interests between the two industries, we feel that the majority interest in the rubber industry and the majority interest in the plastics industry will be served best by separate publications.

It gives me great pleasure to announce that my recommendation that Arthur Merrill be selected as editor of the new publication was accepted by the directors of Bill Brothers Publishing Corporation. Arthur Merrill has been on the staff of RUBBER WORLD for a period of more than eight years. Immediately after becoming a member of the staff he was put in charge of that section of the book devoted to plastics technology. Thus he steps into the shoes of editor of the new publication with eight years of background.

R. G. Seaman

Compounding for Low Cost with

J. L. Hartman[1] and D. C. Thompson[1]

NEOPRENE TYPE WHV, a high-viscosity form of Neoprene Type W, is useful in compounding for low-cost, highly competitive products because large quantities of semi- or non-reinforcing carbon blacks and aromatic petroleum oil extracts may be used to give easy processing stocks and vulcanizates with good physical properties.

Blends of Neoprene Type WHV with Type W are useful for nerve-free compounds of intermediate elastomer content.

Extrusion rates for blends of Neoprene Types W and WHV show an optimum in the direction of higher amounts of Type WHV as the temperature is increased.

NEOPRENE Type WHV is the most recent addition to the family of polychloroprene-base elastomers. It is a high-viscosity form of Neoprene Type W recommended for compounds of low elastomer content and is particularly useful in compounding for low-cost, highly competitive products. It also may be used in blends with neoprenes of lower viscosity to improve certain processing characteristics.

The W types of neoprene are well suited for compounds having a low elastomer content primarily because their vulcanizate properties are superior to those of the sulfur modified types at equivalent loading levels. In addition, the W types resist mechanical breakdown to a greater degree and therefore may be extended with large quantities of filler and softener without becoming excessively sticky and mushy. Neoprene Type WHV was introduced to make possible the development of compounds of even lower elastomer content than found practical when only the lower viscosity material was available.

Selection of Neoprene

The viscosity of compounds of low neoprene content is important to ease of processing and varies with the loading. Depending on this point, Neoprene Type WHV, therefore, may best be employed to provide the desired viscosity either by blending or as the only elastomer. The optimum ratio of Type W to Type WHV in blends will vary depending on specific processing requirements, vulcanizate hardness level, and the type of filler and softener. A higher percentage of Neoprene Type WHV must be employed as the total neoprene content is reduced. Very highly extended compounds require the use of Neoprene Type WHV as the sole elastomer.

Selection of Filler

Carbon black imparts better properties to neoprene vulcanizates than mineral fillers and generally is preferred as loading in compounds of low elastomer content. It has been shown that types of carbon black having a particle size smaller than that of SRF carbon black have limited value in highly extended compounds.[2] The best balance between cost and quality, particularly for compounds having a vulcanizate hardness below 80 durometer, is achieved with MT carbon black. The finer particle sized carbon blacks give firmer uncured preparations. Therefore the use of some SRF carbon black is recommended in very highly extended Neoprene Type WHV compounds because loading beyond a certain point with MT carbon black alone is likely to result in excessively soft uncured stock preparations which are difficult to handle. Low-cost, non-black Neoprene Type WHV compounds are best extended with clay although the stocks are more sticky, and the vulcanizates have lower quality than equivalently loaded carbon black compounds.

Selection of Oil

The naphthenic-base rubber process oils commonly used in conventional neoprene compounds are not compatible at high concentration. They are apt to bloom to the surface of the vulcanizate as well as the uncured stock when used in excess of 25 parts by weight per 100 of neoprene. If amounts greater than this are required, petroleum oils, described as solvent extracts of high-boiling lubricating oil distillates, are recommended. These consist of complex mixtures of hydrocarbons which are predominantly aromatic. The essentially aromatic nature of these oils makes them highly compatible with neoprene although their exact chemical composition and physical properties may vary widely. Selection of the oil will depend on factors such as proximity of source, processing requirements, factory conditions, and the characteristics desired in the finished product.

A number of oils have been evaluated at high concentration in neoprene[2] and found to impart different processing characteristics and vulcanizate properties. Manufacturers should evaluate carefully all formulations containing large amounts of oil to establish their processability and, particularly, to be sure that the oil is compatible before engaging in full-scale production. Should these oils contain more than a small percentage of paraffins or a moderate amount of naphthenes, an objectionable bloom is liable to result.

Neoprene—Carbon Black—Oil Relation

A series of Neoprene Type W and WHV compounds which varied in elastomer content from approximately 60% to less than 20% by volume has been studied. A carbon black to oil ratio was selected which gave a vulcanizate hardness of 60-70 durometer for all compounds. The following base formula was used:

Neoprene Type W or WHV	100
Neozone A*	2
Stearic acid	0.5
Magnesia	2
Petrolatum	2
Paraffin	2
Carbon black	Variable
Petroleum extract	Variable
Zinc oxide	5
NA-22*	0.5

*Du Pont rubber chemicals division.

[1] Rubber chemicals division, E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del.
[2] D. C. Thompson, *Rubber Age (N. Y.)*, 72, 638 (1953).

Neoprene Type WHV

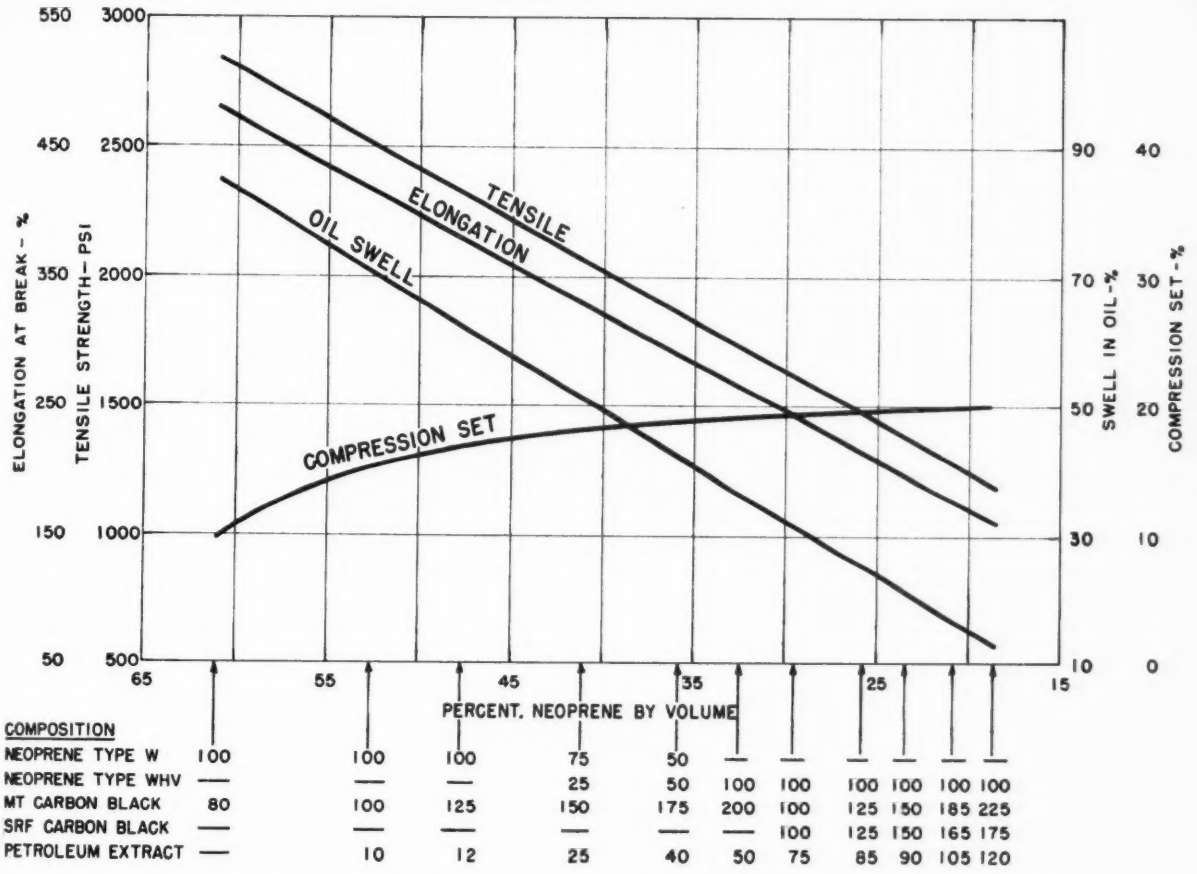


Fig. 1. Some Physical Properties of 60-70 Durometer Hardness Neoprene Compounds of Varying Elastomer Content

The vulcanizates were cured 20 minutes at 307° F. or equivalent.

As shown in Figure 1, the ratio of Neoprene Type W to Type WHV and the ratio of MT to SRF carbon black was changed progressively to maintain processability as the carbon black and the oil were increased. The relative percentage of these components required for optimum processability will vary with specific conditions, but, for most applications, compounds of this hardness class (60-70 durometer) having less than 45% neoprene by volume should contain some Neoprene Type WHV. Compounds having less than 35% neoprene by volume generally require the use of Neoprene Type WHV as the sole elastomer. Stocks loaded with MT carbon black to a neoprene content of less than 30% by volume are mushy and putty-like; so some SRF carbon should be included.

Some physical properties of these compounds are plotted in Figure 1. It will be noted that tensile strength, elongation at break, and swelling in oil are directly proportional to the elastomer content. Compression set, however, does not vary linearly, but increases at a diminishing rate as the elastomer content is reduced. It is remarkable to note that a Neoprene Type WHV vulcanizate, having as little as 18% by volume elastomer, has a tensile strength of 1,200 psi., an elongation of 160%, a compression set after 22 hours at 70° C. of 20%, and only 13% volume increase in ASTM Oil No. 3 after immersion for 70 hours at 100° C. The figure should prove useful in predicting the vulcanizate properties of a multitude of neoprene compounds varying greatly in cost and quality. If the modifying effects of other compounding ingredients are established, Figure 1 will become more valuable.

Compound Modifications for Processing

The base compositions will require modification to meet specific processing and vulcanizate requirements. For example, clay may be required in place of some of the MT carbon black to impart firmness and freedom from nerve to the uncured stock. It also will increase elongation at break, but will lower the tensile strength and compression set resistance.

Thermoplastic extenders and polymeric hydrocarbons may be used for the same purpose. They also increase elongation at break, but reduce set resistance and generally increase hardness. Among the materials recommended are coal-tar pitch, mineral rubber, styrene-butadiene resins, coumarone-indene resins, and petroleum-still residue derivatives.

Factice imparts excellent processing characteristics, but its use is limited by its adverse effect on tensile strength.

Lubricants in the form of stearates, petrolatum, and

wax may require adjustment for resistance to sticking and ease of mold release. Tackifiers, such as wood rosin, may be needed for certain building operations. These materials seldom need to be used in amounts great enough to affect vulcanizate properties markedly.

A great number of Neoprene Type WHV compounds have been developed for specific products.[3] In most cases the compounding principles outlined herein have been applied with suitable modification to meet particular processing requirements and specification tests.

Antioxidants and Waxes

It has been reported that large amounts of filler and softener have an adverse effect on the weather and ozone resistance of neoprene vulcanizates.[4] Antioxidants and waxes are required to inhibit effectively the attack by ozone of low-elastomer content neoprene vulcanizates. The use of two to five parts of a hydrocarbon wax and three to five parts of an antioxidant, such as Thermoflex A,[5] Akroflex CD,[5] BLE,[6] Aminox,[6] or Santoflex AW,[7] is recommended in compounds subject to outdoor exposure. Many antioxidants may be ineffective or even deleterious to ozone resistance; so careful selection and thorough testing are mandatory. Furatone 1547,[8] if used in excess of 10 parts, is highly effective as an antiozodant, but it has no antioxidant properties in neoprene.

Curing System

For most applications the curing system of the base formula is recommended. NA-22 is a strong, fast accelerator, particularly suited for use in highly extended compounds which tend to slow curing. If greater processing safety is required, however, the use of 0.5-part Thionex,[5] 0.5-part DOTG, and one part sulfur in place of the NA-22[9] may be used with little effect on the vulcanizate properties shown.

Neoprene Type WHV *versus* Type S in Blends with Type W

The use of Neoprene Type S in blends with general-purpose neoprenes previously has been recommended to impart greater firmness to uncured stock preparations.[10] Certain limitations attend this practice. The firmness imparted by Type S is accompanied by an undesirable degree of nerve. Unless mixing precautions are exercised, the Neoprene Type S is liable to blend poorly, becoming dispersed as small, discrete particles throughout the softer matrix.

The use of Type WHV, instead of Type S, for this purpose overcomes these disadvantages. Homogeneous blends are prepared easily with Type WHV, and, for an equivalent viscosity increase, much less nerve exists than in blends with Type S.

The latter effect is shown in Figure 2. The nerve of several Neoprene Type W/Type S and Type W/WHV blends was measured by applying a rating to the roughness observed when they were milled under standard conditions for six minutes. This procedure involved using a 500-gram batch on a six- by 12-inch laboratory mill with 50° C. water circulated through the rolls. These ratings are plotted against the ratio of elastomer. The Mooney viscosity (ML-2½) of each blend was measured, and points of equal viscosity are connected by arrows. This figure may be applied in predicting the proper ratio of Neoprene Type W to Type WHV to use, based on previous experience with Type W/Type S blends. For example, the same degree of firmness obtained with a blend of 90 parts of Type W and 10 parts of Type S (A of Figure 2) will be realized with a blend of 70 parts of Type W and 30 parts of Type WHV (B of Figure 2) but with considerably less nerve.

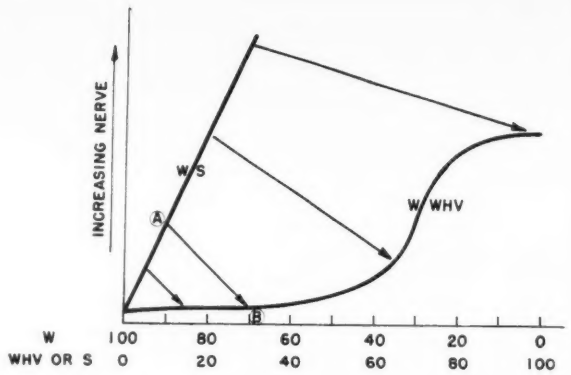


Fig. 2. Nerve-Viscosity Relation of Neoprene Blends; Points of Equal Viscosity Are Connected by Arrows

Effect of Neoprene Type W/Type WHV Ratio on Extrusion Rate

The rate at which an elastomer compound will extrude is an important factor which influences processing economy in most manufacturing plants. The effect of changing the ratio of Neoprene Type W to WHV on the viscosity and nerve of the blends has been shown. To determine how these effects, in turn, influence extrusion characteristics, a series of compounds, identical except for polymer ratio, was studied over the range from 0 to 100% Neoprene Type WHV. The formulation shown below was used:

Neoprene Type W and/or WHV	100
Neozone A	2
Stearic acid	0.5
Petrolatum	1
Paraffin	2
Magnesia	4
MT carbon black	200
Petroleum oil extract	50
Zinc oxide	5
DOTG	0.75
Thionex*	0.75
Sulfur	0.75

*Du Pont rubber chemicals division.

The compounds were extruded through the Garvey[11] die, using a No. 1 Royle extruder having a two-inch worm. Studies were made under three different temperature conditions by controlling the temperature of the water circulated through the barrel, head, and worm, as well as the voltage applied to the electrically heated die, as shown below.

	A	B	C
Worm, water temperature, °F.	100	100	100
Barrel, water temperature, °F.	120	140	140
Extension, water temperature, °F.	120	140	160
Fixed head, water temperature, °F.	140	160	170
Hinged head, water temperature, °F.	160	180	200
Die, watts	40	60	80

[3] Du Pont rubber chemicals division, BL Report 249 (1953).
[4] D. C. Thompson, R. H. Baker, R. W. Brownlow, *Ind. Eng. Chem.*, 44, 850 (1952).
[5] Du Pont rubber chemicals division.
[6] Naugatuck Chemical, division of United States Rubber Co., Naugatuck, Conn.
[7] Monsanto Chemical Co., St. Louis, Mo.
[8] Irvington Varnish & Insulator Co., Irvington, N. J.
[9] R. M. Murray, D. C. Thompson, *Rubber Age* (N. Y.), 74, 911 (1954). (Abstract only.)
[10] Du Pont rubber chemicals division, BL Report 225 (1948).
[11] B. S. Garvey, Jr., M. H. Whitlock, J. A. Freese, Jr., *Ind. Eng. Chem.*, 34, 1309 (1942).

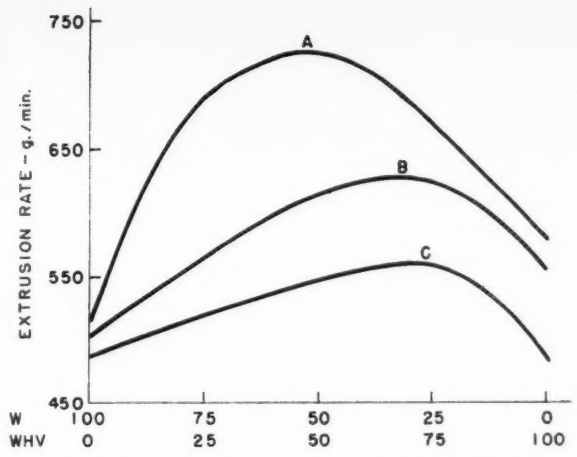


Fig. 3. Extrusion Rates of Neoprene Type W/Type WHV Blends

All compounds extruded smoothly with little or no swelling at the die. The compound, based on Neoprene Type WHV as the only elastomer, possessed a degree of firmness considered normal for most factory handling requirements. As the Neoprene Type WHV content was increased, the stocks became increasingly firmer, and the extruded sections more dense.

The variation in extrusion rate with polymer ratio for the three temperature conditions used is shown in Figure 3. An optimum ratio was observed, above and below which the extrusion rate decreased markedly. As the temperature of the extruder was increased, the extrusion rate decreased, and the optimum ratio was displaced in the direction of higher concentrations of Neoprene Type WHV.

This reaction indicates that for maximum extrusion rate a moderately low barrel temperature should be maintained, and compounds should be used which are softer than would be considered ideal from the standpoint of resistance to deformation during subsequent processing.

Summary and Conclusions

Neoprene Type WHV, a high-viscosity form of Neoprene Type W, is the most recent addition to the family of polychloroprene-base elastomers. It is recommended for compounds of low elastomer content and is particularly useful in products wherein quality and cost strike a delicate balance.

Unusually large quantities of the proper types of filler and softeners may be used to give easy processing stocks and vulcanizates having remarkably good physical properties.

Semi- or non-reinforcing carbon blacks or clay is preferred as loading. Certain predominantly aromatic petroleum oil extracts are highly compatible with neoprene and function as excellent plasticizers in highly extended compounds.

Antioxidants are essential for ozone resistance in all highly extended compounds.

Neoprene Type WHV may be used in blends with Type W or as the sole elastomer in highly extended compounds. It also may be used to impart greater firmness to uncured stocks without producing the undesirable degree of nerve associated with Neoprene Type S.

Several practical compounds are given which demonstrate the compounding principles described in this paper.

Machine to Mass Produce Rubber-Soled Shoes

A hydraulic machine which molds, vulcanizes, and attaches rubber soles and heels to the leather uppers of shoes in one automatic operation has been unveiled by C. & J. Clark, Ltd., Somerset, England. Available to shoe manufacturers together with a comprehensive technical service program covering all phases of production, the machine is the subject of an article in a recent issue of *Rubber Development*.[1]

In addition to permitting rapid production, the machine reportedly produces an absolutely standard product whose bond between the rubber and the leather is stronger than either of the joined components. Some 250,000 pairs have been manufactured on these machines without a single case of vulcanization failure, the company states.

The machine, invented by Señor G. Mediano and modified by Clark, follows the C.E.M.A. process of shoe fabrication. Hard rubber as well as sponge rubber can be accommodated on the unit, which is capable of achieving pressures up to 1,000 psi. Furthermore, a wide variety of shoe types, including high leg boots, can be handled in all sizes.

Each machine molds one pair of shoes during the standard cycle of 10 minutes, but as many as five machines can be set up to operate simultaneously. This operation is accomplished by equipping one machine as a master unit with controls, pumps, and oil tanks. Thus, all five units can be handled by one operator.

Construction includes two lasts, each of which has its own pair of horizontally movable side molds, and a vertically movable sole mold. To prepare the machine for a cycle, the half molds are opened to their limit and loaded with a weighed charge of rubber; the sole plates (or pistons) are lowered; the uppers are fitted on the lasts, and a piece of unvulcanized rubber is placed on each piston. In operation, the side molds close, and the piston rises to exert suitable pressure and shape the sole. The side and sole molds, but not the lasts, are electrically heated to cause flow and vulcanization of the rubber.

An interesting detail in the manufacture is the priming of the bottom of the shoe with a coating of self-vulcanizing rubber before the process begins, a precedure which, the company claims, results in completely satisfactory vulcanization and 100% bonding between the leather and the rubber. Another such detail is the use of special knife plates which are fixed to the tops of the side molds and fit snugly against the upper when the molds are closed. It is contended that this practice plus the accurate weighing of the batch and the fine machining of the mold sections, has resulted in almost total avoidance of wastage in the molding.

[1] Spring, 1954, p. 2. (Published by The British Rubber Development Board, London, England; available from Natural Rubber Bureau, 1631 K St., N.W., Washington 6, D. C.)

Comparison of Methods of Accelerated

T. H. Rogers[2] and H. H. Heineman[2]

FOUR conventional methods of aging foam rubber offer little correlation and are not a true measure of the service life of the product.

The Compression Change Over (212° F.) Aging Method described in this article appears to correlate more satisfactorily with shelf aging at room temperature. By conducting the test at 270° F., the aging time is greatly decreased.

An alternate oxygen absorption method also appears satisfactory for evaluating foam rubber in a relatively short period of time.

THE growing importance of latex foam rubber in our economy has focused attention on the durability of the material over a long period of time. Latex foam rubber is made up of a network of interconnecting cells having a more or less uniform structure. The number of cells varies, depending upon the type of structure and the density or ratio of rubber and air. The greater the density of the latex foam rubber, the smaller are the cells, and a greater number of cells is contained in the product.

It has been determined from a number of specimens of varying densities that the quantity of cells varies from 227,000 per cubic inch to 4,520,000 per cubic inch, and the cell size varies from 0.0007-inch in diameter to 0.0021-inch in diameter. Inasmuch as the cells are interconnected, a tremendous surface is thus exposed to attack by the surrounding gas medium which, in normal and accustomed use, is air.

The industrial utilization to which latex foam rubber has been put makes it imperative that an accelerated aging test be employed that not only is reasonably fast, but also is an approximate indication of what the material will do under normal aging conditions.

The problem, as stated, may appear rather complex, but when we consider the large number of uses to which latex foam rubber is put such as for pillows, mattresses, automobile seat cushioning, furniture upholstering, shoe applications, and other miscellaneous applications, the complexity of the problem is further increased. As with other rubber products, the end-use for which the latex foam rubber is intended should determine the type of accelerated aging test that is to be used.

An evaluation of latex foam rubber under static conditions by an accelerated test may, however, be used to determine the relative value of the rubber compound as such. The evaluations described in this paper were done to examine and compare the existing methods being used for the accelerated aging of latex foam rubber with the objective of either modifying or enlarging on them to establish more adequately the true aging life of the product.

Accelerated Aging Testing Methods

The four commonly used methods for testing aging characteristics of latex foam rubber are:

Method 1. The RMA accelerated aging air[3] oven test which determines the change in compression resistance of a sample of foam rubber after 22 hours at 212° F. aging. This test sets limits of ±20% maximum change in compression resistance.

Method 2. The RMA accelerated aging air bomb test[3] at 260° F. and 60 psi. for two hours determines the condition of the sample, such as being either soft and tacky, or hard and brittle. Compression testing before and after the air bomb aging testing is a quantitative means of evaluating the foam rubber sample. This test is similar to ASTM D454-52[4] except for the lower pressure used.

Method 3. ASTM D572-52[4] — accelerated aging testing of vulcanized rubber by the oxygen-pressure method. The change in compression after 96 hours in an oxygen bomb at 70° C. and 300 psi. pressure is a quantitative measure of the aging property of the foam rubber.

Method 4. ASTM D573-52[4]—air oven method of aging at 70° C. for one week. Change in compression of the foam rubber sample, expressed in percentage, is used to indicate extent of aging.

Although these tests do show differences in specimens, they do not give data which approximate the aging performance of the product. Concerning the first-mentioned test, it is known that vulcanization continues after the beginning of aging, and this effect outweighs the degrading effect of oxygen.[5] This competitive reaction, where the hydrocarbon may react with either the sulfur or the oxygen,[6] makes a determination of compression change, after aging for a relatively short period of time at an elevated temperature, a questionable measure of aging life.

When testing methods 2 and 3 are used, the specimens also undergo the after-vulcanization reaction and the oxidation change during the test, and there is no satisfactory basis for determining to what extent one sample differs from another in age-life.

Method 4, which involves the air oven treatment @ 70° C. for one week, does offer some measure of the aging life of foam rubber, but it is not sufficiently complete to indicate long-term aging life.

These accelerated aging tests for latex foam rubber measure the change in compression of the material which again indicates the great importance of this property in the actual use of the product. For most applications such as furniture upholstery, automobile cushioning, and bedding, the foam rubber is covered with a fabric. Stress/-strain properties are of some importance during the initial fabricating operation, but, for the long-term aging, compression resistance is of prime concern. If a furniture cushion becomes very soft and tacky, or if it becomes extremely hard and brittle, the utilitarian property of the product is lost.

[1] Presented before the Division of Rubber Chemistry, A. C. S., Chicago, Ill., Sept. 10, 1953.
[2] Goodyear Tire & Rubber Co., Akron, O.
[3] "The RMA Buyer's Specification of Latex Foam, April 1, 1953." Rubber Manufacturers Association, Inc., 444 Madison Ave., New York, N. Y.
[4] "ASTM Standards on Rubber Products, Methods of Testing, Specifications, Dec., 1952," American Society for Testing Materials, 1916 Race St., Philadelphia, Pa.
[5] R. Judemstein, *Rubber Chem. Tech.*, Oct., 1949, p. 1028.
Park, *Rubber Age (London)*, 7, 64 (1927).
Stevens, *J. Soc. Chem. Ind.*, 37, 305T, 340T (1918).
[6] S. Baxter, W. McG. Morgan, D. S. P. Roebuck, *Ind. Eng. Chem.*, Feb., 1951, p. 446.

Aging of Latex Foam Rubber[1]

TABLE 1. RESULTS OF VARIOUS AGING TESTS ON FOAM RUBBER SAMPLES

Foam Sample Identification and Description	Test Method #1 RMA Accelerated Oven Aging Test (22 Hrs. at 212° F. in Circulating Dry Air) *Values in % Change in Compression*	#2 RMA Accelerated Air Bomb Aging Test (b) (2 Hrs. at 260° F. at 60 Psi. Air Pressure. % Change in Compression. Similar to ASTM D454-52 except for 60 Psi.). *Values in % Change in Compression*	#3 ASTM D572-52 Accelerated Aging of Vulcanized Rubber by the Oxygen Pressure Method (96 Hrs. at 70° C. and 300 Psi.). *Values in % Change in Compression*	#4 ASTM D573-52 Oven Method Aging (70° C., One Week). *Values in % Change in Compression*
#1 Laboratory sample (Normal structure)	+15.6	+ 1.8	+ 1.0	0.0
#2 Laboratory sample (Coarse structure)	+25.4	+ 4.9	+ 9.1	+10.1
#3 Commercial Foam A (100% Natural)	−13.6	−32.4	− 6.9	−11.1
#4 Commercial Foam A (60% Natural/40% synthetic)	+ 9.1	0.0	+ 8.1	+ 8.6
#5 Commercial Foam B (100% Natural)	+12.1	+10.3	+ 8.7	+ 7.2
#6 Commercial Foam B (70% Natural/30% synthetic)	+ 9.2	+ 3.8	+ 5.5	+10.2
#7 Commercial Foam B (50% Natural/50% synthetic)	+ 7.6	+ 6.4	− 4.3	+ 6.8
#8 Commercial Foam C (100% Natural)	+28.9	+ 7.0	+12.6	+18.7
#9 Commercial Foam D (100% Natural)	+13.1	− 5.0	0.0	+ 1.4

Other accelerated aging tests that may be used were designed originally for testing vulcanized rubber. Some of these involve the change or loss in stress/strain properties brought about by a measured degree of deterioration. Because the stress/strain properties of latex foam rubber are so low initially, it is difficult to measure with standard rubber testing equipment the small changes that occur after the initial drop. Inasmuch as latex foam rubber is used almost exclusively for cushioning where the material is enclosed in a cover, the stress-strain property, and the factors affecting it, are not so important as the compression, and the factors affecting it.

Besides the selection of an accelerated aging test for latex foam rubber that gives a more complete picture of the life of the material it is also essential that the test be made using equipment that is relatively common to most laboratories. Inasmuch as accelerated aging testing is usually a routine function, it is also helpful if the test be such that it can be performed with a minimum of professional supervision.

Compression Change Oven 212° F. Aging Method

An accelerated aging test that we have found to be more informative than the ones commonly used is actually an extension of the one which measures the % change in compression after oven (212° F.) treatment for 22 hours (Method 1). Instead of judging the specimen on one value, a series of values is obtained over a longer period of time. If the time of completing the test has to be shortened, a higher oven temperature may be considered. By plotting the % change in compression against the time of oven aging, a graph is developed which shows the after-vulcanization effect, the softening effect, the hardening effect, and the changes that the latex foam rubbers go through during heat aging.

The air oven used for this test may be the standard ASTM Designation D573-52[4] type used for the accelerated aging of vulcanized rubber.

[7] G. W. Blum, J. R. Shelton, H. Winn, *Ibid.*, p. 464.

O_2 Absorption Method

For the purpose of comparison, the oxygen absorption method using volumetric-type equipment, made similar to that constructed at Case Institute of Technology,[7] was also used. For foam rubber evaluation this method appears to be highly satisfactory and offers a relatively rapid system for obtaining long-term aging data.

The cell wall thickness of all the foam samples tested fall well under the thickness established for satisfactory accelerated aging and oxidation testing in order to avoid the effect of diffusion. These upper limits have been established as 0.040-inch for vulcanizates containing synthetic and as 0.20-inch for vulcanizates containing natural rubber.

Preparation of the Samples

The laboratory samples (#1 and #2 in Table 1) were prepared using a five-quart Hobart Frother and were of the following composition:

	Dry Weight
Natural rubber	100.0
K-Oleate	1.0
Methyl zimate*	1.0
Captax*	1.5
Sulfur	2.0
AgeRite White*	1.0
Zinc Oxide	2.00
K_2SiF_6	1.8

* R. T. Vanderbilt Co., New York, N. Y.

The structure of the foam was regulated by the regulation of the whip speed. For the coarse structure foam the gelants, potassium fluosilicate and zinc oxide, were added after frothing and were mixed into the latex at high speed.

For the normal-structure foam sample a medium whip speed was used, and the finishing ingredients were mixed into the foam at the medium speed. The samples were cured, washed, and dried in the same manner.

The commercial samples of foam (A, B, C, and D in

Fig. 1. Goodyear Apparatus for Determining Compression of Latex Foam Sponge. Sample Is Placed under Adjustable Metal Plate on Pan of Balance, and Sufficient Weight Added to Obtain Desired Compression

Table 1), which were all slab stock material, were acquired through the regular sales channels. An analysis of the specimens was made to determine the percentage of natural rubber and synthetic rubber. The nature of the synthetic rubber was not determined, but it was not a polychloroprene type. It was assumed to be one of the government manufactured high-solids GR-S synthetic latex polymers.

The test specimens from each sample were made by first slicing horizonally in such a manner that a one-inch thick slab was obtained, and then clicking 1¼-inch diameter disks out of the slab. These disks were allowed to remain at room temperature over night before the initial compression was taken.

The compression was taken by determining the load necessary to reduce the thickness of each specimen by 25%. This work was done by using a triple-beam single-platform balance (approximately 25,000-gram capacity) on a ring stand with an adjustable metal plate above the balance platform. The specimen was placed on the scale platform, and sufficient weight was added on the beam to counterbalance the specimen. The metal plate was then adjusted so that it was parallel to the top surface of the specimen and was making contact with it. An additional five grams were added to the beam in order to press the sample firmly against the plate without actually reducing the gage of the specimen. Enough weight was then added to the beam to reduce the thickness of the specimen by 25%. This value was the initial compression of the specimen. (See Figure 1.)

TABLE 2. RATING OF SAMPLES ON AGING PROPERTIES USING TEST METHODS #1, #2, #3, AND #4

Test Method #	1	2	3	4
Foam Sample Identification and Description				
#1 Laboratory sample (Normal structure)	7	2	2	1
#2 Laboratory sample (Coarse structure)	8	4	8	6
#3 Commercial Foam A (100% Natural)	6	9	5	8
#4 Commercial Foam A (60% Natural 40% synthetic)	2	1	6	5
#5 Commercial Foam B (100% Natural)	4	8	7	4
#6 Commercial Foam B (70% Natural 30% synthetic)	3	3	4	7
#7 Commercial Foam B (50% Natural 50% synthetic)	1	6	3	3
#8 Commercial Foam C (100% Natural)	9	7	9	9
#9 Commercial Foam D (100% Natural)	5	5	1	2

After an initial compression was obtained on each sample the various accelerated aging tests were started.

Oven aging at 212° F. was done by placing a specimen of each foam rubber sample on a horizontal corrugated cardboard tray in a circulating hot air oven which was already up to 212° F. and could be maintained at 212° F. ±2° F. The specimens were removed after 22 hours and, after resting at room temperature 30 minutes, were compressed again, by using the same procedure as that used in obtaining original compression. The specimens were then returned to the oven, and at regular intervals thereafter until embrittlement, were (1) removed from the oven, (2) allowed to rest at room temperature for 30 minutes, (3) compressed, and (4) returned to the oven. Deterioration was expressed as percentage change in compression deflection values during aging.

Results

The results of the conventional accelerated aging tests are shown in Table 1. Table 2 shows the order of the samples in quality of aging, using each of these tests. Observe that Sample #1 ranges from first to seventh in the order of rating, using these four tests, whereas Sample #2, which has the same composition and density but a

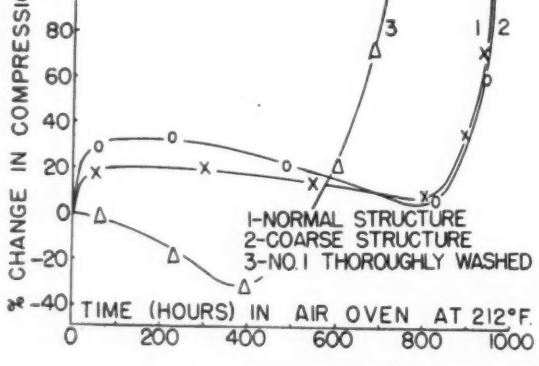


Fig. 2. Results of Compression Change/Oven 212° F. Aging Method Tests Showing Effect of Structure and Washing on Aging of Foam Rubber

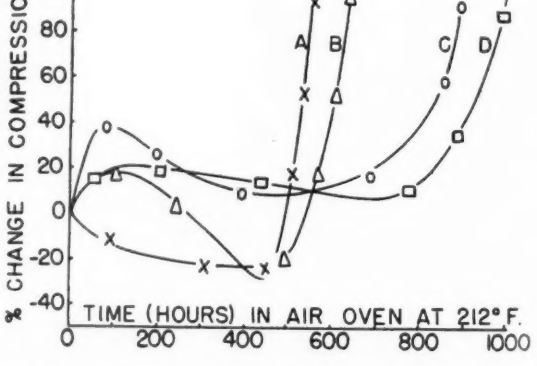


Fig. 3. Compression Change/Oven 212° F. Aging of Four 100% Natural Rubber Foam Samples; Effect of Residual Curing Agents during First 240 Hours Most Evident in Sample C

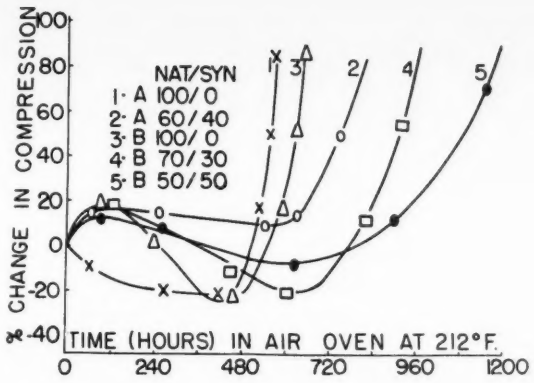


Fig. 4. Improvement in Long-Term Oven Aging Obtained by Increasing Content of Synthetic Rubber in Foam

coarser cell structure than Sample #1, ranges from fourth to eighth in order of rating.

Figure 2 shows the long-term aging properties of Samples #1 and #2 (as described in Table 1), using the compression Change/Oven (212° F.) Aging Method. Sample #2, which has the coarser cell structure, has the same long-term aging life as Sample #1, but the compression change is much greater during the first part of the oven aging. This phenomenon appears to be due to excess or additional vulcanization. The coarseness of the structure results in less material being washed from the foam during the washing procedure; consequently a greater quantity of the unreacted curing ingredients remains in the foam rubber, accounting for the higher compression increase. Sample #3 is the same as Sample #1 except that it was throughly washed with a strong detergent to remove more completely the unreacted compounding ingredients.

Figure 3 shows four commercial foams consisting of 100% natural rubber. Commercial foam C, which is the worst of the lot using the conventional test methods (referring to Table 2 it is ninth, seventh, ninth, and ninth in order) actually is better than commercial foams A and B when the Compression Change/Oven 212° F. Aging Method is used. This sample shows the effect of the residual curing ingredients, as is indicated by the large compression increase during the initial 240 hours of oven aging.

Figure 4 shows the effect on long-term oven aging of synthetic rubber contained in the foam. Curves #1 and #2, which represent Samples #3 and #4 in Table 1, were from commercial producer A. The foam described by Curve 1 was analyzed as 100% natural rubber, and

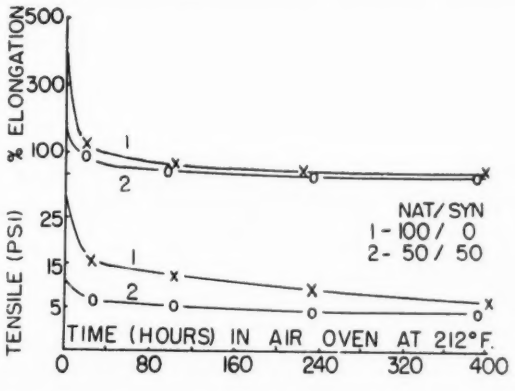


Fig. 6. Effect on Tensile and Elongation of Long-Term Oven Aging on Natural and Natural/Synthetic Foam

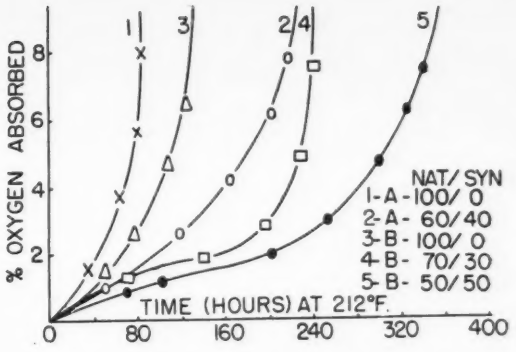


Fig. 5. Long-Term Aging of Foam, Using Oxygen Absorption Method; Note That Results Show Samples in Same Order as Figure 5

that by Curve 2 as 60% natural/40% synthetic. The improved long-term aging of foam containing increased quantities of synthetic is also shown by curves 3, 4, 5 (same as Samples #5, #6, #7, in Table 1), which represent foam from another commercial producer. From these results it appears that as the percentage of synthetic increased from 10% for foam samples #1 and #3 up to 50% for foam sample #5 the long-term aging properties improved.

Figure 5 shows the order of samples described in Figure 4, using the oxygen absorption method. The order of these is the same as in Figure 4.

Figure 6 shows the effect on tensile and elongation of natural and synthetic foams with long-term oven aging. Whereas the original physical properties are much higher for the all-natural foam as compared to the 50% natural/50% synthetic foam, on extended aging, the properties of the all-natural foam fall at a faster rate and approach those of the part-synthetic foam.

Figure 7 shows the effect of heat aging in a nitrogen atmosphere on the compression of the four commercial foam samples consisting of 100% natural rubber. The post-vulcanization effect is observed in three of the samples. After a year at 212° F. in a nitrogen atmosphere these samples show no upward trend in compression, as is the case when an air atmosphere is used.

Figure 8 shows the effect of extended heat aging in a nitrogen atmosphere on the compression of the foam samples described in Figure 4. Here again the after-vulcanization effect may be observed. After a year in the nitrogen atmosphere at 212° F., the foam samples are still flexible, and no upward trend in compression resistance can be detected.

Figure 9 shows the effect of density on the aging of foam rubber (100% natural composition) using the Compression Change/Oven (212° F.) Aging Method. The lower the density, the greater surface is exposed, and the faster is the aging rate.

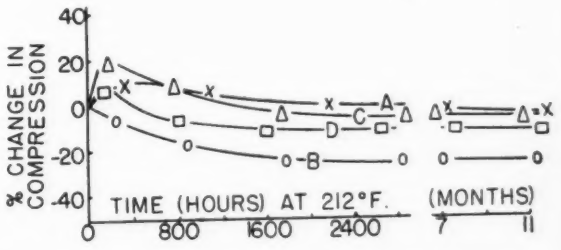


Fig. 7. Oven Aging in Nitrogen of Four Natural Rubber Foam Samples; No Increase in Compression Even after One Year

Figure 10 shows commercial foam samples aged at 270° F. in air and the effect of compression change. The samples are in the same order as shown in Figure 4, but they become much softer during aging at the higher temperature. Also the rate is greatly increased, for example, from a maximum of 1,080 hours for #5 foam sample at 20% change in compression at 212° F. (Figure 4), to 87 hours at 20% change in compression at 270° F. (Figure 10).

Figure 11 shows the effect of room temperature shelf aging on the compression of foam rubber over a period of three to six years. The after-vulcanization effect is apparent in these samples, and no softening has yet set in. If the peaks of these curves are compared to the first peaks of the curves on Figure 4, it appears that at four years no more than 25% of the life of the foam samples has been expended. This testing will have to continue for a number of additional years to confirm this apparent correlation.

Summary

For the accelerated aging of foam rubber it appears that the four conventional methods of testing offer little correlation. A method has been described which employs the regular ASTM D 573-52 oven used for accelerated aging of rubber products, and the % change in compression is plotted against time of aging. This method shows some degree of correlation with the oxygen absorption method. It also shows the degree of after-vulcanization.

When the Compression Change/Oven (212° F.) Aging Method of test is used, the presence of synthetic rubber in the foam appears to improve the aging life. When the test is conducted at 270° F., the time before resinification occurs is greatly decreased.

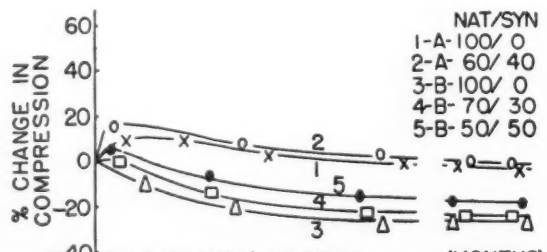


Fig. 8. Oven Aging in Nitrogen of Natural and Natural/Synthetic Foam Samples; Again No Increase in Compression after One Year

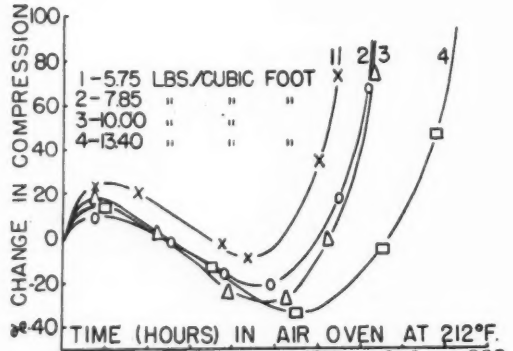


Fig. 9. Effect of Foam Density on Oven Aging; Lower Density (Greater Surface Exposed) Shows Faster Aging

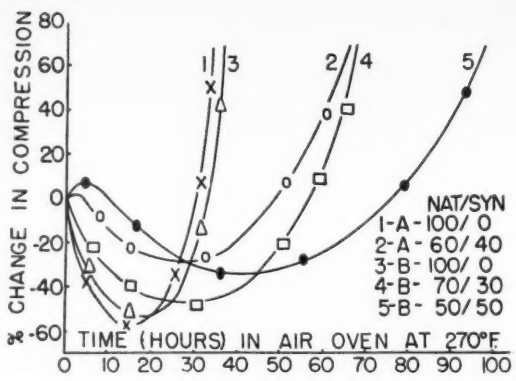


Fig. 10. Oven Aging at Higher Temperature (270° F.) of Natural and Synthetic Foam Shortens Aging Period Severalfold

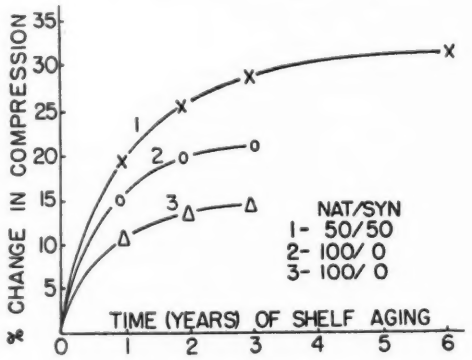


Fig. 11. Room Temperature Shelf Aging of Natural and Synthetic Foam; About 25% of Service Life Used in Four Years

There appears to be some similarity between shelf aging at room temperature of foam rubber, as measured by compression change, and accelerated aging, as measured by the Compression Change/Oven (212° F.) Aging Method.

Rubber Coupling for Pipes

The development of a new rubber coupling and its successful application to seal connecting piping of steel, concrete, earthenware, and asbestos-cement has recently been announced.[1] Invented and presently being used in South Africa, the coupling is reported to provide two important advantages: although very flexible, it maintains a perfect seal; and its installation requires no special preparation of the pipe ends.

The new unit consists essentially of a rubber cylinder which fits inside the ends of the two pipes to be joined. Its external diameter is slightly smaller than the bore of the pipes, but its ends are flared outward and diminish in thickness toward the extremities. The coupling is manually inserted into the bore of the pipe; the flared ends are squeezed in to form a seal with the pipe wall. Subsequent pressure from gas or liquid passing through the pipe forces the sealing lip (coupling ends) more firmly against the wall and thus completes the desired seal.

[1] *Rubber Developments*, Spring, 1954, p. 20. (Published by The British Rubber Development Board, London, England; available from the Natural Rubber Bureau, 1631 K St., N.W., Washington 6, D. C.)

Reinforced Rubber Stocks under the Electron Microscope[1]

M. M. Chappuis,[2] M. H. Polley,[2] and R. A. Schulz[2]

A "TRANSFER technique" and microtome technique method have been developed for preparing standard rubber stocks for electron microscope examination.

The "transfer technique" method is rapid and simple and is adequate for the identification of unknown carbon black in an unvulcanized stock.

The microtome technique is more satisfactory in that it reveals clearly discrete particles of reinforcing pigment as they are dispersed in the rubber matrix.

DURING the past 10 years the electron microscope has been an invaluable aid in identifying and classifying carbon blacks and other finely divided rubber reinforcing agents. Since the majority of these materials falls in the 100 to 300 Å particle size range, observation of discrete particles is possible only under the electron microscope, where a resolution of 30 Å is possible.

It is generally accepted that the properties which these reinforcing pigments display in rubber, such as direct current conductance, modulus, and shrinkage of compounded stocks, is to a major extent associated with both the degree and the nature of the dispersion which these pigments attain in the rubber. The degree of dispersion considered is that associated with particle-to-particle contacts rather than the more macroscopic type associated with incomplete "wetting" or incorporation of black into the rubber stock. Poor dispersion due to incomplete mixing can readily be observed by visual examination of a freshly cut surface of the stock, or by observation of an Allen "squeeze out"[3] of the stock at a magnification of about 400× in an optical microscope.

To resolve individual carbon black particles in a rubber stock, however, the electron microscope is required. The major difficulty involved has been preparing sections of the required thinness. Owing to the limited penetrating power of electrons, these sections must not be thicker than 0.05-micron. This difficulty in sectioning rubber was pointed out many years ago by Tidmus and Parkinson,[4] who suggested that the elasticity of the rubber must be reduced temporarily in order to cut thin sections. Freezing the rubber with either liquid air or dry ice made it possible to cut sections to 10 microns, using a heavy sled microtome fitted with a freezing stage. Ladd and Braendle[5] later developed a special high-speed microtome. In their case the rubber strip was embedded in paraffin. A high-speed centrifuge was selected as a carrier for the knife so that the maximum cutting speed of the knife was some 230 miles an hour.

Experimental Details

Two techniques for preparing films of standard rubber stocks for electron microscope examination have been developed in this laboratory.

Transfer Technique Method

A rapid "transfer technique" has been devised for examination of unvulcanized stocks, and a microtome sectioning technique for vulcanized stocks. In the former, an edge of the stock is moistened with benzene. This tacky edge is then quickly pressed down on to a Formvar coated glass microscope slide, and the film with the transferred stock is then stripped from the glass slide on to water from which it is mounted on regular 200-mesh specimen grids. The question can be raised as to whether or not the dispersion has been altered by this technique. The usefulness of the method lies in its simplicity and in the fact that it is adequate for the identification of an unknown carbon black in an unvulcanized stock.

It is the purpose of this paper to describe a second, more versatile, procedure for the examination of reinforcing agents in vulcanized rubber stock. By means of an

[1] Presented in part before the annual meeting of the Electron Microscope Society of America, Philadelphia, Pa. (1951).
[2] Research and development laboratory, Godfrey L. Cabot, Inc., Cambridge, Mass.
[3] R. P. Allen, *Ind. Eng. Chem., Anal. Ed.*, 2, 311 (1930).
[4] *Trans. Inst. Rubber Ind.*, 13, 52 (1937).
[5] *Rubber Age (N. Y.)*, 57, 681 (1945).

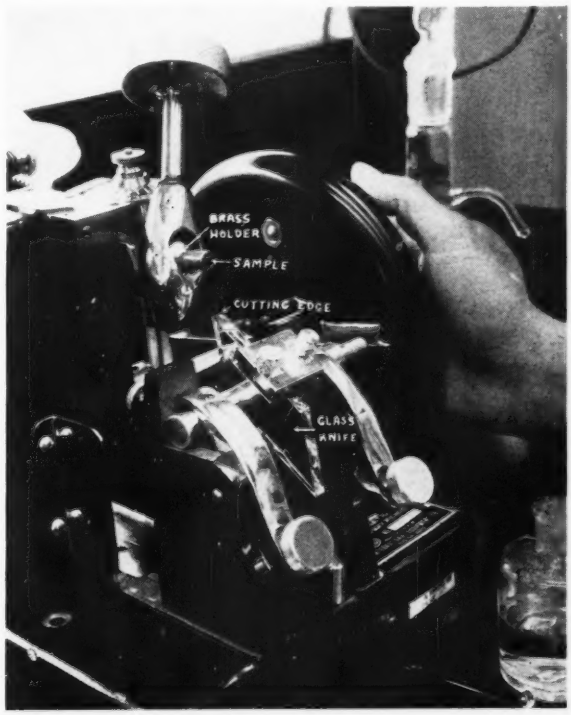
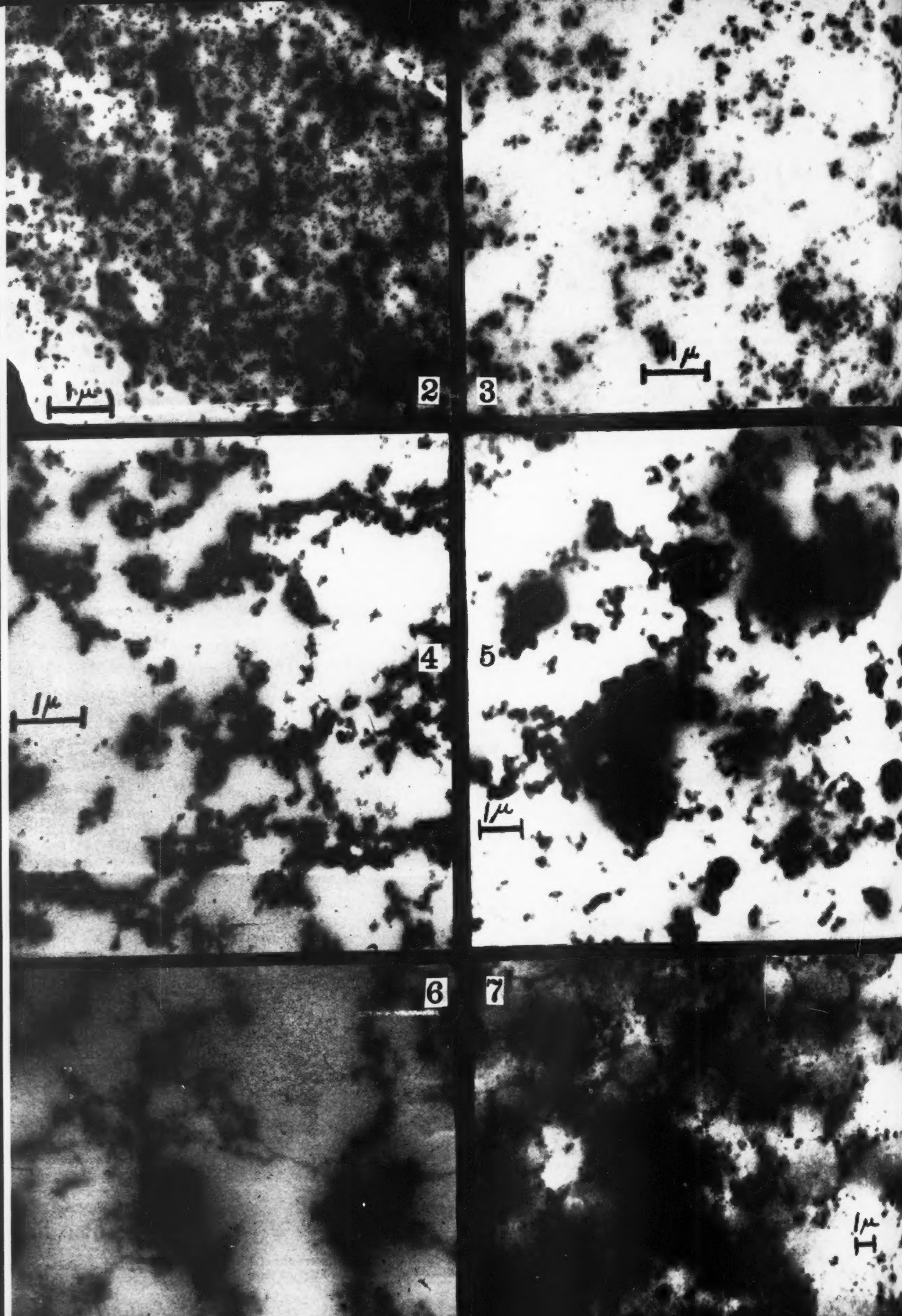


Fig. 1. The Minot International Rotary Microtome Equipped with a Glass Knife. (Arrows Point to Brass Holder, Sample, Cutting Edge, and Glass Knife)



2
3
4
5
6
7
1μ

ultra-thin sectioning rotary microtome, sections of sufficient thinness to be viewed under the electron microscope can now be obtained.

Microtome Technique Method

The technique for the preparation of vulcanized rubber samples for electron microscope examination has been patterned after procedures developed in the field of biology as, for example, the work of Newman *et al.*,[6] Geren and McCulloch,[7] and Latta and Hartman.[8] The technique involves embedding in butyl methacrylate. The specimen is suspended in the monomer, and polymerization is then carried out. For our application, a thermal polymerization technique is used rather than the peroxide catalyst recommended by the above authors. Peroxide leads to excessive swelling of the rubber stock during polymerization. Consequently peroxide-type catalysts have been abandoned, and the following embedding procedure has been developed:

A strip of cured rubber stock approximately 3.0 by 0.3-by 0.3-millimeter is suspended in a No. 4 gelatin capsule. Butyl methacrylate monomer, previously washed free of inhibitor with 1N Na_2CO_3 and thoroughly dried over $CaCl_2$, is added; the capsule is capped and suspended in a circulating air oven. Polymerization is brought about by heating the capsule for two hours at 50° C. to release trapped air and to insure diffusion of the monomer into the rubber stock. This is followed by heating for about 15 hours at 100° C. If the preliminary impregnation step at 50° C. is allowed to proceed too far, the rubber will swell unduly. On the other hand, a rubber which is more resistant to penetration by the monomer may require soaking in butyl methacrylate several hours prior to embedding.

A Minot International rotary microtome,[9] shown in Figure 1, has been used for the sectioning. The embedded sample is mounted in a special brass holder, and the "glass knife"[8] adjusted to allow a clearance angle of about 10 degrees. This "glass knife" is made by the proper fracture of ordinary plate glass and provides an extremely keen edge. It lasts for about 300 sections and then can be discarded as it is low in cost. Using the coarsest feed, one micron, a ribbon of sections is cut, which floats off on a drop of water held to the knife edge by a wax crayon line about seven millimeters below the cutting edge. The feed is gradually decreased to the finest adjustment, i.e., 0.05-micron. The final ribbon of sections is picked up with the tip of a glass filament and transferred to a Petri dish of water. The sections are flattened by warming the water to 40°-50° C. for 15 minutes. Using a 10× eyepiece, a section may be properly centered and picked up on a 400-mesh specimen grid. White paper under the Petri dish and good illumination help in mounting the tiny section.

A 50-micron aperture is used in the objective pole piece of the RCA Type EMU electron microscope. Care must be taken to increase the intensity gradually as the sections tear quite easily under the electron beam.

Results and Discussion

Typical electron micrographs illustrating both the "transfer technique" and the microtome technique are shown in Figure 2 and Figures 3-7, respectively. The "transfer technique" method was used to obtain the micrograph reproduced in Figure 2. This is a sample of Spheron 4 (HPC) at 50 parts' loading in natural rubber. The dispersion is extremely uniform. As previously mentioned, it has not been definitely established that this dispersion is characteristic of the parent stock because of the treatment the rubber underwent in the transfer process. The chief merit of this technique lies in its simplicity and rapidity. It is adequate to identify the carbon black in an unvulcanized rubber stock.

Figures 3 and 4 show representative microtome sections of standard tire tread stock. In Figure 3 the Spheron 4 (HPC) carbon black is well dispersed throughout the vulcanizate. In contrast, Figure 4, which is a section of another tread containing channel black, shows a very poor dispersion.

A section of Butyl rubber stock is pictured in Figure 5. This stock contained 50 parts of a high modulus furnace black and 50 parts of lampblack. The fact that a mixture of two blacks has been employed is readily discernible.

The sectioning technique has been applied successfully to rubber stocks containing reinforcing agents other than carbon black. For example, Figure 6 is an electron micrograph of a lignin-reinforced GR-S stock.[10] It may be noted that the lignin is particulate in nature. The swelling of the rubber specimen was particularly marked in this sample. On a volume basis, the strip had swollen about 100 times its original size after polymerization of the butyl methacrylate. For all of the other samples the volume expansion was less than five times the original size, i.e., approximately 1.7 times in each dimension.

Of further interest is the "resin-reinforced" rubber section[11] shown in Figure 7. This reinforced rubber was prepared by adding formaldehyde and resorcinol to natural rubber latex and then carrying out the condensation to the resin *in situ*. The water was then evaporated from the latex, and vulcanization carried out to obtain the "resin-reinforced" rubber. The micrograph clearly shows the original natural latex particles surrounded by the small particulate resin particles.

Summary

Procedures are described for the examination of reinforced rubber stocks under the electron microscope. The most satisfactory method consists of embedding the stock in butyl methacrylate and then cutting sections approximately 0.05-micron thick with a rotary microtome equipped with a special feed. Electron micrographs of these thin sections clearly reveal the discrete particles of reinforcing agent as they are dispersed throughout the rubber matrix.

Acknowledgments

The authors are indebted to David McCulloch and
(*Continued on page 512*)

[6] S. B. Newman, E. Borysko, M. Swerdlow, *Science*, 110, 66 (1949); *J. Research, Nat'l. Bur. Standards* 43, 183 (1949).
[7] "Experimental Cell Research," Vol. II, No. 1, 97 (1951).
[8] *Proc. Soc. Exptl. Biol. Med.*, 74, 436 (1950).
[9] Manufactured by International Equipment Co., Boston, Mass.
[10] R. A. V. Raff, G. H. Tomlinson, T. L. Davis, W. H. Watson, *Rubber Age (N. Y.)*, 64, 196 (1948).
[11] J. LeBras, I. Piccini, *Ind. Eng. Chem.*, 43, 381 (1951).

(For Figures 2-7, see opposite page)

Fig. 2. "Transfer Technique" Section of a Natural Rubber Tread Stock Containing 50 Parts of HPC Black. Good Dispersion
Fig. 3. Microtome Section of a Natural Rubber Tread Stock Containing 50 Parts of HPC Black. Good Dispersion
Fig. 4 Microtome Section of a Natural Rubber Tread Stock Containing 50 Parts of a Channel Black. Poor Dispersion
Fig. 5. Microtome Section of a Butyl Rubber Stock Containing 50 Parts of HMF Black and 50 Parts of Lampblack
Fig. 6. Microtome Section of a Lignin-Reinforced GR-S Stock
Fig. 7. Microtome Section of a Resin-Reinforced Natural Rubber Stock

Properties and Uses of Alkali-Metal

D. R. Hammel[2] and M. H. Reich[2]

SODIUM catalyzed butadiene-styrene polymers used in tires showed no superiority to polymers made at 41° F. for tread applications, but in the carcass one set of four tires showed excellent durability.

Hysteresis of sodium catalyzed polymers, already better than emulsion-type polymers, has been further improved by the addition of processing oil. A suitable method for the introduction of the oil into such polymers has been devised.

THE use of sodium as a catalyst for the polymerization of butadiene has been known for some time (1).[3, 4] Mixtures of sodium and potassium have also been suggested for the preparation of copolymers of butadiene and styrene.[5] Sodium catalyzed polymers have been shown[2] to be of great interest because the structure is different from that of elastomers prepared by emulsion polymerization.

Early work at the Government Laboratories (3) indicated that sodium catalyzed polymers might find application in tread and/or carcass stocks. Accordingly, the Office of Synthetic Rubber requested the Government Laboratories to prepare larger amounts of this material for more complete evaluation. To this end a continuous reactor was constructed on a pilot-plant scale, and suitable quantities of sodium catalyzed polymers were prepared at 86 to 188° F. (4).

Some of the factors such as polymerization temperature, styrene content, raw viscosity, and compounding ingredients, affecting the physical properties of these polymers compounded according to tread and carcass recipes, have been presented (5). Later developments at the Government Laboratories (6, 7) under this program uncovered additional factors affecting the physical properties of these polymers and also have indicated other uses for sodium catalyzed polymers.

Preparation of Polymer

A reactor of tubular design was constructed in the pilot plant to operate on a continuous basis (see Figure 1). Monomers, alkali-metal catalyst, and a suitable diluent were fed at predetermined rates into a premixing vessel connected to a length of jacketed steel tubing. The bulk of the polymerization occurred in this tube. The polymer was automatically discharged from the tube by means of a controlled valve activated by the pressure within the reactor. The versatility of the system permitted many changes in formulation and reaction conditions, thus providing polymers of varied types for evaluation (8). Minor mechanical changes also made the same system applicable to polymerizations utilizing Alfin catalysts which were prepared at the Government Laboratories on the basis of prior investigations by A. A. Morton at the Massachusetts Institute of Technology (9).

Discussion

An earlier publication (5) describing the general physical properties of sodium catalyzed polymers showed that polymerization temperatures of 168° F. or higher aided the low-temperature properties without affecting the other physical properties measured. Increases in the styrene content of copolymers improved the tensile strength, flexing characteristics, and quality index and deteriorated the low-temperature properties, but did not affect the hysteresis values. Increases in the raw viscosity of the polymer from 12 to 95 ML-4 Mooney viscosity seemed to increase the tensile strength without changing the mill processing, extrusion, rebound, and hysteresis properties. It was shown that curing and scorching characteristics, tensile strength, hysteresis, and rebound properties could be changed by variations in the compounding ingredients. The addition of processing oil to sodium catalyzed polymers improved the hysteresis properties, whereas the tensile strength decreased.

TABLE 1. ALKALI-METAL CATALYZED POLYMER BLENDS PREPARED FOR TIRE TESTING ON THE GOVERNMENT FLEET

Polymer Designation	BD/S Ratio	Preparation Temp., °F.	Mooney Viscosity ML-4
78P17	75/25	168	37
XP-211	87.6/12.4	168	50
XP-220	75/25	188	58
XP-221	80/20	160	50
XP-258	75/25	188	55
XP-259	80/20	166	50

TABLE 2. SUMMARIZED RESULTS OF TIRE TESTS* USING ALKALI-METAL CATALYZED POLYMERS IN THE CONSTRUCTION OF THE CARCASSES

Tire Test	Carcass Polymer	% Synthetic	Durability Rating	Av. Final Mileage
A	GR-S (GR-S tread)	68	100	10571
	78P17 (HMF Black) (X-611 tread)	68	91	9610
	78P17 (HAF Black) (X-611 tread)	68	103	10865
	Russian Na-Cat. Polybutadiene (X-611 tread)	68	99	10423
B	41° F. 80/20 BD/S	68	100	8351
	XP-211	68	96	7984
C	GR-S-100 (GR-S 1500)	72	100	8131
	XP-220	72	<106	8608
D	X-624 (X-624 tread)	68	100	10576
	XP-221 (X-624 tread)	68	83	8733
	X-624 (XP-221 tread)	68	40	4266
	XP-221 (XP-221 tread)	68	67	7100
E	GR-S-100	68	100	28856
	XP-258/XP-259†	68	167	48237
	D730	68	86	24897

***In another project a 75/25 BD/S copolymer prepared by sodium catalysis at 104° F. to 68 ML-4 viscosity rated 91 for treadwear resistance against GR-S-AC in four-ply 6.00-16 cotton cord tires in half and half tread tests.**

†XP-258 was used in the outer plies and XP-259 was used in the inner plies.

[1] The work discussed herein was performed as a part of the research project sponsored by the Reconstruction Finance Corp., Office of Synthetic Rubber, in connection with the Government Synthetic Rubber Program.

[2] Government Laboratories, University of Akron, Akron, O.

[3] Numbers in parentheses refer to Bibliography items at end of this article.

[4] F. E. Mathews, E. H. Strange, British patent No. 24,750 (1910).

[5] F. H. Ebert, R. Heidenbrock, P. Orth, United States patent No. 2,209,746 (July 30, 1940).

Catalyzed Polymers[1]

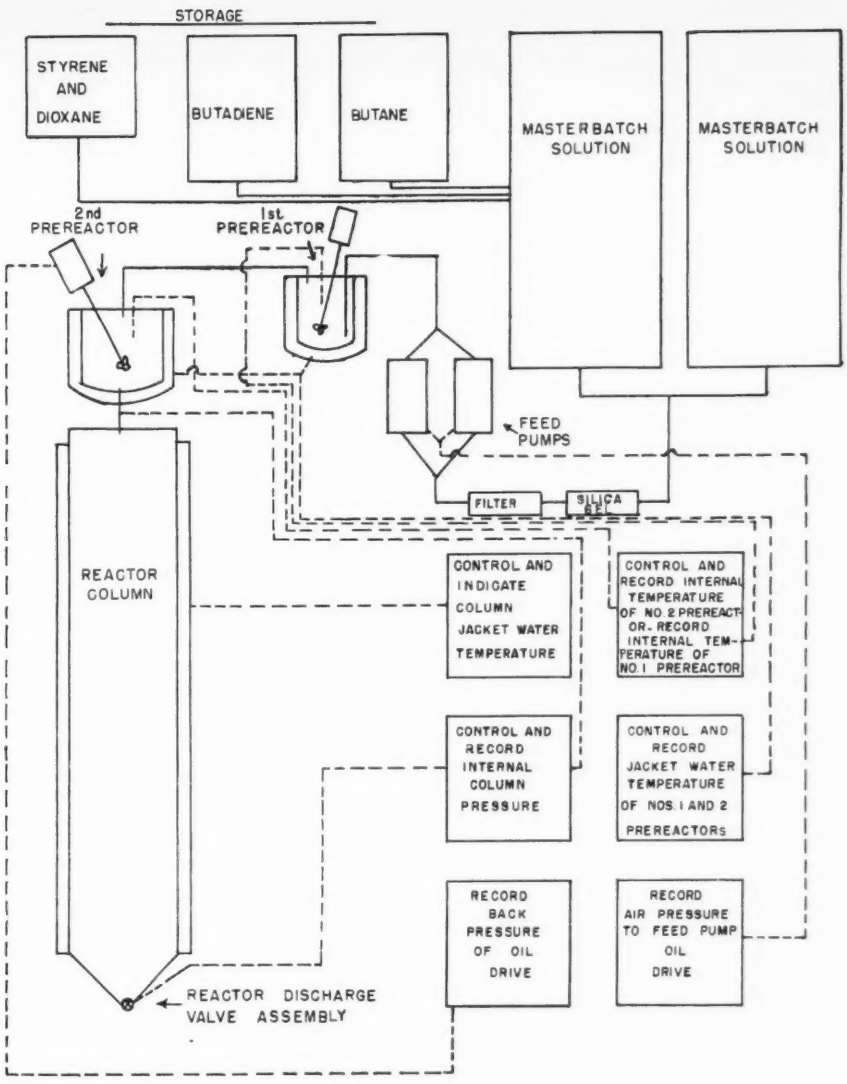


Fig. 1. Tubular-Design Reactor for Continuous Polymerization of Alkali-Metal Catalyzed Polymers; Monomers, Catalyst, and Dilutent Are Premixed and Then Fed to Tubular Reactor

Blends of a 75/25 butadiene/styrene copolymer with about 70% of natural rubber were seen to have good stress-strain and hysteresis properties at 212° F. Tests on sodium catalyzed polymers compounded by a typical wire insulation recipe showed that sodium catalyzed polymers compared favorably to emulsion-type polymers with respect to water absorption and were superior with respect to electrical resistivity.

Tire Test Data

These data indicated a need of evaluation, especially in tire tests, of alkali-metal catalyzed polymers. Therefore blends were prepared of 87.6/12.4, 80/20, and 75/25 butadiene/styrene (charge ratio) copolymers (10) (see Table 1), and tires were manufactured by members of the rubber industry for testing on the Government Tire Test fleet (11, 12). Laboratory tests results on these polymers (7) were essentially the same as the results for other alkali-metal catalyzed polymers of this type (5): namely, hysteresis properties that were better, low-temperature flexibility that was poorer and other physical properties that were generally similar to those of GR-S.

Tire test results, shown in Table 2, varied, but the alkali-metal catalyzed polymers showed no superiority to polymers made at 41° F. for tread applications. However, one set of tires made using a blend of 75/25 and an 80/20 butadiene/styrene copolymers (XP-258 and XP-259) in the carcass of 9.00-20, 10-ply rating, rayon cord highway tires, exhibited excellent durability (11). One of the tires tested was injured early in the test and was not included in the durability rating or the average final mileage, but the remaining two tires averaged 48,237 miles, compared to 28,856 miles for the GR-S-100 (GR-S 1500) controls. Accordingly, additional study of aklali-metal catalyzed polymers is under way.

Oil-Polymer Masterbatches

The incorporation of oil into emulsion polymers has improved the hysteresis and afforded extension without serious deterioration of the other physical properties (13). Since sodium catalyzed polymers have shown better hysteresis properties than elastomers prepared by emulsion processes, and the addition of oil has further improved these properties (5), methods were studied for introducing oil into high Mooney viscosity (over 100 ML-4) alkali-metal catalyzed polymers.

Heretofore the oil has been added on a mill for laboratory testing, but this method would prove inadequate for factory processing. Banbury mixing is undesirable be-

cause high initial power requirements are needed to masticate polymers of high viscosity. The most suitable method investigated for preparing masterbatches was to agitate the shredded polymer with the processing oil in an oil-water emulsion. The rate of absorption of oil by the polymer was high initially, then decreased after about 30 minutes of agitation. Masterbatches containing about 40 parts of oil were obtained by agitating 100 parts of the polymer with 100 parts of the oil (in an emulsified state) for a period of 15 minutes; the viscosity of the base polymer was reduced from 120 to 50 ML-4 Mooney viscosity.

Polybutadiene

Alkali-metal catalyzed polybutadiene exhibits physical properties that are generally similar to that prepared by emulsion polymerization except that the low-temperature flexibility is poorer. However the difference in the structure of alkali-metal catalyzed polybutadiene makes it applicable to many purposes for which emulsion polymers are not as desirable. One of the applications for this type of material was proposed by German investigators,[6] in which sodium catalyzed polybutadiene was used for the preparation of a thermosetting plastic with excellent resistance to solvents and chemical reagents and extremely good dielectric properties. This material was further studied by the Russians (14) who investigated the structure by using X-rays.

The superiority of sodium catalyzed polybutadiene over that from emulsion processes was attributed by Coffman (15), in a recent study, to the higher ratio of 1, 2 addition found in the former. The Government Laboratories has prepared samples of alkali-metal or Alfin catalyzed polymers applicable to this end which would require little or no purification or extraction before use. The polymer is removed from the continuous reactor in a semi-solid state and submerged into methanol without the addition of any antioxidant or other materials which would have to be extracted before treatment. In this state the polymer may be stored.

The foregoing discussion relates some of the pilot-plant progress obtained with polymers made by this method of catalysis.

Summary and Conclusions

Polymers for evaluation in tire tests and in other applications were prepared at the Government Laboratories by a continuous process employing alkali-metal catalysts. One of four sets of tires, the carcasses of which contained alkali-metal catalyzed 75/25 and 80/20 butadiene/styrene polymers, exhibited excellent durability and lasted longer in a road test than did the GR-S-100 (GR-S 1500) controls.

About 40 parts of processing oil were incorporated in a high-viscosity alkali-metal catalyzed polymer by agitating for 15 minutes 100 parts of the shredded polymer with 100 parts of oil, in the form of an oil-water emulsion.

Polybutadiene was prepared by alkali-metal or Alfin catalyzed reactions that could be used in the production of highly cross-linked thermosetting plastics with good dielectric properties for insulation material.

Bibliography

(1) C. Harries, *Ann.*, 383, 157 (1911).
(2) C. S. Marvel *et al.*, *J. Polymer Sci.*, 1, 275 (1946).
A. E. Juve, Meyer, *Ind. Eng. Chem.*, 39, 1490 (1947).
W. A. Schulze *et al.*, *Ibid.*, 41, 414 (1949).
(3) H. Goldsmith private communication to Office of Synthetic Rubber, Reconstruction Finance Corp., Washington, D. C. (1949).
—, B. G. Labbe, *Ibid.* (1950).
(4) R. E. Schneider, H. Goldsmith, private communication to OSR.
—, M. H. Reich, *Ibid.* (1952).
(5) M. H. Reich, R. E. Schneider, W. K. Taft, *Ind. Eng. Chem.*, 4 2914 (1952).
(6) D. R. Hammel, M. H. Reich, private communication to OSR (1953).
(7) R. E. Schneider, M. H. Reich, D. R. Hammel, *Ibid.* (1952).
(8) D. R. Hammel, M. H. Reich, *Ibid.* (1953).
(9) A. A. Morton, *Ibid.* (1944).
(10) R. E. Schneider, M. H. Reich, *Ibid.* (1951).
—, —, D. R. Hammel, *Ibid.* (1952).
(11) I. J. Sjothun, E. Read, *Ibid.* (1953).
(12) I. J. Sjothun, E. Read, *Ibid.* (1949 and 1952).
(13) W. K. Taft, R. W. Laundrie, J. Duke, A. D. Snyder, *Ibid.* (1952).
(14) G. A. Blokh, A. D. Zaianchkovskii, *Rubber Chem. Tech.*, 21, 727 (1948).
(15) *Ind. Eng. Chem.*, 44, 1421 (1948).

[6] O. Schmidt, B. Schnell, E. Meyer (to I. G. Farbenindustrie A.G.), U. S. patent No. 1,901,044 (1933).

Reinforced Rubber Stocks

(*Continued from page 509*)

Cecil E. Hall, of Massachusetts Institute of Technology to the former for his assistance during the initial stage of this work and to the latter for his many helpful discussions; to Jean Le Bras of Institut Français du Caoutchouc, Paris, France, and to W. H. Watson, of Polymer Corp., Ltd., Sarnia, Ont., Canada, for permission to include the micrographs of the "resin-reinforced" and lignin-reinforced rubbers; and to Walter R. Smith, of Godfrey L. Cabot, Inc., for suggesting and guiding this research.

New Coagulant Dip Process

At the Rubber Stichting, Delft, Holland, a new calcium chloride coagulant has been developed for use in latex-dipping processes.[1]

The coagulants based on calcium chloride hitherto employed give the best results on porous molds, but because pores gradually become clogged, manufacturers have turned to smooth-faced, non-porous molds. Their use, however, entails a number of disadvantages, and even with the Hansen process only thick, simple (cylindrical) shapes can be successfully produced. The new coagulant avoids the difficulties and is said to be suitable for all kinds of dipped goods, thin- as well as thick-walled, for simple as well as complicated forms like surgical and industrial gloves and bathing caps.

It is a solution of varying proportions of calcium chloride in alcohol, to which are added 2% of a wax-free shellac or synthetic resin A F S[2] and 0.1% of a wetting agent known as Brij 30.[3] For most articles 20% calcium chloride gives the best results. The resin in the solution forms a film with a certain porosity; the advantages of a porous surface for latex dipping are thus provided; and at the same time the addition of a wetting agent insures a favorable critical angle.

It takes only a minute of drying in air to obtain a solid film of coagulant on the mold, which can then immediately be dipped into the latex bath without preheating. The whole process so far—dipping into coagulant and drying the film, then dipping into latex—requires about five minutes. Gelation of the latex in air takes a few minutes more; then the dipped article can be dried and vulcanized in warm water, when calcium chloride present is at the same time washed out.

[1] Described by P. Braber and G. W. van Raamsdonk, in Communication No. 230b.
[2] A product of the Bayer company of Leverkusen, Germany.
[3] Made by Atlas Co.

Application of Adiabatic Techniques To Polyethylene Extrusion—I[1]

E. C. Bernhardt[2] and J. M. McKelvey[3]

IN ITS broadest terms, a complete extrusion theory would permit all the performance characteristics of extruders to be calculated if the following data were known:

(1) The dimensions of the extruder, the screw, and the die;
(2) The thermal, viscous, and mechanical properties of the plastic;
(3) The operating conditions of the extruder, such as the screw speed and the power supplied to the barrel heaters;
(4) The entering temperature, pressure, and state of aggregation of the plastic.

We believe that such a theory may never be completely developed. Our approach has been to consider separately the various zones of an extruder, such as the feed pick-up zone, the compression zone, the metering zone, and the die. For each of these zones we postulated certain idealized conditions and then attempted to find mathematical solutions that would be valid for the postulated conditions.

At first, much of our attention was directed to the metering zone, as we believe that quite often the metering zone controls the overall extruder performance. The metering zone of the screw is located just before the die. In this zone the plastic is a viscous fluid. Since viscous flow theory has a sound theoretical background, we were able to draw upon this for help in the derivation of equations describing the behavior of the plastic in this zone. Consequently, problems of viscous or melt flow were the most amenable to successful mathematical solutions. Our initial report[4] on this work consisted of an analysis of isothermal melt flow. Results obtained from experiments on extruders which were fed viscous liquids and operated at near-isothermal conditions verified these melt flow equations.

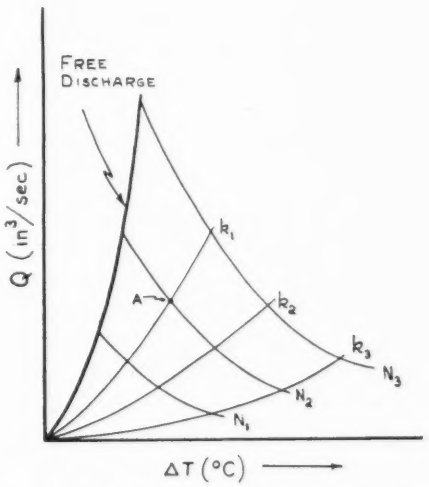


Fig. 1. Typical Performance Diagram for Adiabatic Melt Extrusion. Q Is Extrusion Rate, and ΔT Is Temperature Rise of the Molten Plastic

We next considered the case of adiabatic extruder operation, and a mathematical analysis[5] of adiabatic operation of melt extruders was reported. Considerable data have now been collected from polyethylene extrusion experiments in which the extruder was operated under near-adiabatic conditions, and in this paper these data are

IT IS demonstrated that polyethylene extrusion under near-adiabatic conditions can be obtained in practice, and that the adiabatic melt extrusion theory can serve as a semi-quantitative guide to the design of extruders for operation with mostly mechanical power as well as for the analysis of the performance of existing extruders.

Good adiabatic control depends also on the viscosity and viscosity-temperature coefficient of the plastic melt itself.

Even where near-adiabatic operation is possible, screws should be designed for adiabatic operating temperatures less than actually desired, and transferred heat used to bring the stock to the precise operating temperature wanted.

[1] Based on a paper presented at the National Technical Conference, Society of Plastics Engineers, Inc., Toronto, Ont., Canada, Jan. 29, 1954.
[2] Polychemicals department, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.
[3] Formerly with du Pont, now with ChemSearch, Inc., 4701 York Rd., Baltimore 12, Md.
[4] "Symposium on the Theory of Plastics Extrusion." *Ind. Eng. Chem.*, 45, 969 (1953).
[5] "Theory of Adiabatic Extruder Operation." J. M. McKelvey, *Ibid.*, 46, 4, 660 (1954).

analyzed in terms of the adiabatic melt flow theory, and conclusions are drawn as to the usefulness of the adiabatic theory in practical extrusion problems.

Adiabatic Operation of Plasticating Extruders

The theory of adiabatic extruder operation was derived on the basis of viscous flow and applies, rigorously, only to *melt extrusion*. Therefore, before describing our experimental work on *plasticating extrusion*, it will be helpful to discuss some of the problems involved in extending melt flow theory to include the case of plasticating extrusion.

For adiabatic melt extruders the theory enables us to calculate the relation among the pressure, temperature, extrusion rate, screw speed, and the screw and die constants. This relation is clearly illustrated by a diagram of the type shown in Figure 1, a typical theoretical performance diagram for an adiabatic melt extruder, where the ordinate is the extrusion rate, and the abscissa is the temperature rise of the molten plastic. The heavy line at the left is the free discharge line and shows how the extrusion rate and temperature increase as the screw speed increases. Similarly, the other lines, also radiating from the origin, show this relation for extrusion through dies of various resistances.

The lines which intersect the free discharge line connect points of equal screw speed and show how, at a given speed, the extrusion rate and temperature change as the die resistance changes. Once such a diagram is constructed for a given extruder, the extruder operating point can be quickly located for any combination of screw speed and die resistance. For example, assume that the extruder is operating at speed N_2 and that the die resistance is K_1. The intersection of these two lines, point A, is the extruder operating point.

This diagram illustrates how it would be possible to control independently the extrusion temperature and the extrusion rate, without using external heaters. This is one of the potentials of adiabatic operation. Control of the extrusion rate and temperature can be obtained merely by regulating the screw speed and the die resistance.

How can the die resistance be regulated? One way is to vary the number and size of screens in the screen pack. A more flexible arrangement, though, would be to have a control valve located between the end of the screw and the die. In this way, by regulating the control valve and the screw speed, any combination of extrusion rates and temperatures can be obtained.

Another advantage of adiabatic operation lies in the manner in which heat is added to the plastic melt. If external heaters are used to increase the melt temperature, large temperature gradients may be set up. On the other hand, if the temperature is increased by dissipating mechanical energy in the melt through viscous shearing, no temperature gradients are necessary, and the entire melt can be maintained at a much more uniform temperature. This is a considerable advantage in the extrusion of thermally sensitive plastics and for the high-temperature extrusion of any plastic.

Consider now plasticating extruders. Two questions arise: Can plasticating extruders be operated adiabatically, and, if they can, is it possible to extend the adiabatic melt theory so that it adequately describes adiabatic plasticating extrusion?

Consider the first question. The answer is that sometimes plasticating extruders can be operated adiabatically, and sometimes they can't. It all depends upon the properties of the plastic, particularly the solid-state properties. To obtain adiabatic operation in a plasticating extruder, it must be possible to deform and shear the solid plastic at low temperatures and thereby generate sufficient internal heat to melt it. On the other hand, plastics that are hard and rigid in the solid state are very difficult to shear and work in extruders, and heat transfer must be relied upon to supply most of the energy needed to melt them.

Realizing that with some materials it is possible to operate plasticating extruders adiabatically, are there any further advantages to be gained by this mode of operation? There is one great advantage which concerns the extruder capacity. The flow theory for the metering zone shows that the melt-pumping capacity of a screw is directly proportional to the speed of rotation. Therefore the capacity of an extruder which is able to generate, through mechanical working, all of the heat needed to melt the plastic does not depend on heat transfer, and the capacity is limited only by the maximum speed of the screw.

On the other hand, if we have an extruder in which the plastic is melted primarily with heat which is transferred through the barrel, then increasing the screw speed will have little effect on the melting capacity. True, the overall coefficient of heat transfer may increase with speed, but probably not enough to keep up with the increase in pumping capacity. In other words, when predominantly transferred heat is utilized to melt the plastic, the rate of heat transfer controls or limits the ultimate capacity of the extruder.

If this dependence on transferred heat could be avoided, much higher ultimate capacities could be obtained. Adiabatic operation removes this dependence, since there is a second-power relation between the amount of mechanical working and the speed of the screw. Therefore much higher ultimate capacities of plasticating extruders can be obtained by high-speed adiabatic operation in which most of the heat is generated mechanically. For example, as a demonstration, we have operated our two-inch-diameter extruder under nearly adiabatic conditions at high speeds and have obtained polyethylene extrusion rates of well over 100 pph. These results will soon be discussed in more detail.

Adiabatic operation of plasticating extruders appears to be an attractive idea. Of course, the building of high-speed, high-capacity adiabatic extruders will involve much development work. It is critical that the screw be properly designed for the type of plastic that will be extruded. The relation between the performance of the machine and the design and operating variables is complicated, and designing extruders for adiabatic operation by trial and error is not recommended. Therefore, the question is, can the adiabatic melt theory be used as a design basis for plasticating extruders? This is the question that we have tried to answer with the experiments reported in this paper. These experiments were performed with polyethylene both because it has properties that make it easy to deform and shear it in the solid state and because of the commercial importance of polyethylene extrusion.

Experimental Work

Apparatus

EXTRUDER BARREL: A special two-inch-diameter extruder barrel was used, designed so that measurements of the temperature and pressure of the plastic melt could be made at various locations along the length of the screw. These measurements were made with thermocouples and pressure gages which pass through the barrel wall so that their tips were in contact with the molten plastic. Seven thermocouples and seven pressure gages were spaced alternately along the length of the barrel.

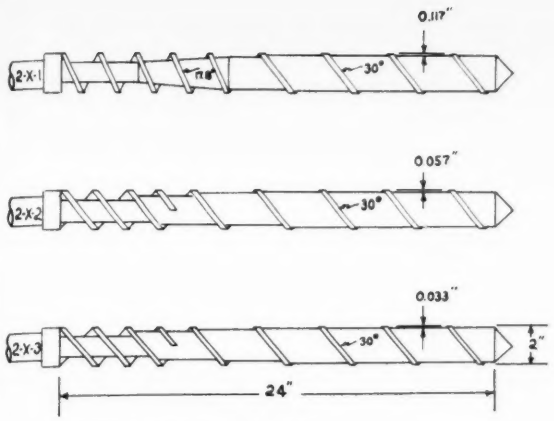


Fig. 2. Experimental Extruder Screws

Barrel heating was provided by six band heaters, giving a total heater capacity of six kw. Barrel cooling, in the vicinity of the feed hopper, was obtained by circulating cooling water through an annular ring just in front of the feed hopper. The cooling-water flow rate was measured with a rotameter, and the temperature rise of the water as it passed through the ring was measured with thermocouples located in the water line at the inlet and outlet connections to the ring.

EXTRUDER DRIVE: The extruder drive consisted of a motor-generator set capable of delivering up to 15 hp. to the gear reducer (a standard type supplied with a No. 1 Royle extruder). The sheaves were changed so that operating speeds up to 190 rpm. could be obtained.

EXTRUDER HEAD: In addition to holding the extruder die, the extruder head also served to streamline the melt flow from the end of the screw to the die. The head temperature was controlled with a band heater. The extrusion dies screwed into the front of the head so that the axis of the die orifice was in line with the axis of the screw. A set of six single orifice dies was used in the experiments. Orifices were all one inch in length, and range from 0.0469-0.3750-inch in diameter, as shown in Table 1.

TABLE 1. DIAMETERS OF EXTRUSION DIES

Die No.	Diameter, In.
1	0.0469
2	0.0625
3	0.0938
4	0.1250
5	0.1875
6	0.3750

SCREWS: Three different screws were used, as shown in Figure 2. The metering zones of the screws were identical except for the depth of the channel. Screw 2-X-1 was single-flighted with an approximately 20-degree helix angle in both the feed and compression zones. The other two screws were double-flighted, with 30 degree helix angles in the feed and compression zones. All of the screws had hollow cores to accommodate electric cartridge heaters.

PRESSURE GAGES: Pressure measurements were made with modified Carley type gages. The Carley method[6] utilizes Bourdon tubes filled with silicone grease. Pressure is transmitted to the Bourdon gage through a tube which is also filled with silicone grease. The end of the pressure transmitting tube extends through the barrel wall and is flush with the inner barrel surface. In the Carley system the transmitting tube is fitted with a piston, which prevents the grease from leaking into the plastic or the plastic from leaking into the grease.

We found, however, that over extended periods of operation the annular space between the piston and the tube wall would become clogged with plastic and would retard or jam the movement of the piston. We therefore removed the piston from the transmitting tube and allowed the plastic melt to come into direct contact with the silicone grease. We found that grease losses from the assembly were negligible and occurred only at the very beginning of a run. The response of the gages without pistons was much faster than with pistons.

THERMOCOUPLES: Iron-constantan thermocouples penetrating through the barrel wall and in contact with the plastic were used for temperature measurements along the extruder barrel.

Procedure

A single large lot of "Alathon" polyethylene resin, having a melt index[7] of 2.0, was obtained for the experimental program. The melt index is a measure of the amount of polyethylene which will flow through a standard orifice, at a standard temperature, and under a standard pressure, in a given length of time. Polyethylene of melt index of 2.0 is representative of a commercial du Pont resin.

For each run the system was first preheated by applying a high voltage to the barrel heaters. The cooling-water flow rate was adjusted so that the barrel temperature at the thermocouple location nearest the feed inlet was maintained in the range of 110-130° C. When the barrel reached the proper temperature the drive was started and adjusted to the desired speed. The barrel-heater voltage was then reduced to about 10-30 volts and maintained there for the remainder of the run. The exact voltage selected depended on the extrusion temperature. The objective was to use the barrel heaters merely to make up heat losses due to radiation and conduction.

Polyethylene cubes were then fed to the hopper, and temperature, pressure, flow rate, and screw speed were measured and recorded at 15-minute intervals. Screw speed was determined by timing screw revolutions with a stop watch. Flow rates were measured by weighing timed samples of the extrudate. All temperatures were read on a potentiometer connected through a selector switch to the thermocouples. Pressures were read directly from the pressure gages.

As soon as three consecutive sets of measurements were obtained in which there was no change in the readings, it was assumed that the extruder operation was in equilibrium, and the measurements were recorded.

(To be concluded)

[6] J. F. Carley, *Ibid.*, 858 (1953).
[7] R. E. Jolly, J. P. Tordella, *Modern Plastics*, 31, 146 (1953).

Three Educational Films on Plastics

Three film-strip programs designed to give consumers the facts on plastics are being distributed for presentation to clubs and schools throughout the nation by The Society of the Plastics Industry, Inc. The films will form part of a program presented by industry speakers to improve plastics quality and encourage proper use of good plastics products.

"Talking Plastics," a script intended for high school juniors and seniors; "Plastics Is Your Business," a 20-minute program for business men's clubs; and "At Home with Plastics," a 45-minute presentation for women's clubs, are the three films now available.

Meetings and Reports

SPI Conference and Plastics Exposition Set New Highs of Interest

The 1954 annual conference of The Society of the Plastics Industry, Inc., and the sixth National Plastics Exposition were held in Cleveland, O., June 7-10. The conference consisted of morning sessions; the first two days were at the Cleveland Hotel; while the last two were at the Statler Hotel. Afternoons were devoted to the Exposition, which was held in the Public Auditorium. The conference also included meetings of various SPI committees; the Society's annual meeting on June 8; a reception, buffet dinner, and concert on Tuesday evening, June 8, at the Auditorium, featuring the Cleveland Summer Orchestra under the direction of Andre Kostelanetz; and an international reception and dinner on Wednesday evening, June 9.

Registration at the conference reached a new high of 1,058, as compared with 550 at the preceding annual conference. The Exposition also set new records; there were 172 exhibitors in 232 booths occupying a net floor area of 52,400 square feet, as compared with 137 exhibitors, 193 booths, and 43,705 square feet of floor area at the last exposition in 1952. Registrants at the Exposition totaled 17,997, as compared with 17,922 at the last show. International visitors totaled 140, representing 28 foreign countries, as compared with 75 and 23, respectively, in 1952.

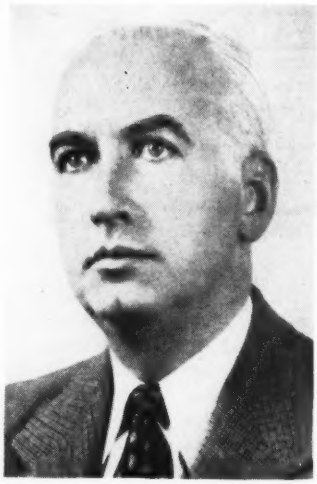
Conference Program

"Plastics Make Things Better for Everybody" was the theme of the conference, which was formally opened by J. J. O'Connell, Consolidated Molded Products Corp. and SPI president, who explained the theme and organization of the meeting. The official address of welcome was delivered by Senator Thomas A. Burke (R-Ohio), who stressed the importance of the plastics industry in the defense effort, and the need of new ideas and ideals in the current cold war.

Monday, June 7

The opening technical session, with Mr. O'Connell presiding, was devoted to radio and television applications of plastics. Three papers were presented at the session, as given below, and were followed by presentation of the film, **"Futures Unlimited,"** produced by Zenith Plastics Co., showing the production and applications of reinforced plastics.

"The Future of Thermosetting Plastics in Television Cabinets," Wyman Goss, General Electric Co. The major portion of TV cabinets of the future will contain plastics in one form or another. The current position of plastics in such cabinets is being challenged by other materials, particularly metals with thermoplastic facing. The plastic manufacturer can meet this challenge by improving his molding, finishing, and handling techniques to reduce costs without impairment of cabinet quality.



John J. O'Connell

"Fully Automatic Molding of Radio and Television Components," L. R. Wanner, Sylvania Electric Products, Inc. The automatic molding and finishing equipment employed by Sylvania for both thermoplastic and thermosetting materials was described, together with plant layout, materials handling methods, and related aspects of product and mold design. It was emphasized that automation requires control of product design, and substantially uniform volume of production.

"Radio and Television—A Plastics Progress Report," D. H. L. Jensen, Philco Corp. Consumer acceptance of plastics in radio and TV is very good, and molders of such products have shown a trend to expanding their operations to include tooling, finishing, and other steps. Tooling time and costs have risen greatly during the past decade, and plastic molding press yield must be increased to meet the competition of wood and metal.

Tuesday, June 8

Concurrent sessions were held, one a symposium on "Plastics, New Materials in the Rubber Industry," and the other a session on new materials.

F. W. Steere, Jr., Steere Enterprises, Inc., presided at the symposium, which featured four papers, as given below, and was followed by a round-table discussion moderated by D. F. Siddall, U. S. Stoneware Co.

"Flexible Materials—Extrusion and Molding Developments," F. A. Martin, Hoover Co. The essential considerations in the molding and extrusion of flexible vinyls and polyethylene were discussed. Special attention was given to the use of dry blending in vinyl compounding; the problem of heating during the injection molding of vinyls; the effect of heat transfer and screw design on vinyl extrusion; mold shrinkage of polyethylene; and blow molding of polyethylene film.

"Plastisols—Processing and Applications," R. P. Molitor, Sun Rubber Co. Details were given on the process and equipment, mold design, materials, and part design for the manufacture of vinyl plastisol products by rotational, slush, and low-pressure casting; dipping; and fabric coating. The need of lubricants to act as stripping agents for slush-cast parts was stressed.

"Vinyl Sponge and Foam—Processing and Applications," G. R. Sprague, Sponge Rubber Products Co. While foam may be generated easily, maintaining the stable froth through the gelling and fusion cycles is the basic difficulty. Polyoxy-ethylene derivatives of fatty acids, small amounts of metallic soaps, and small additions of powdered fillers can be used to control foam stability. Another problem in the actual molding of foam products is the effect of mold construction on the frothed material.

"Rigid Vinyls and Rubber-Resin Blends—Processing and Applications," G. S. Laaff, Bolta Products Division, General Tire & Rubber Co. Rubber-modified vinyls have been produced by the direct addition of premasticated nitrile rubber to fluxed vinyl in a Banbury mixer, or by the coprecipitation of blended latices. These blends are formulated with stabilizers, colorants, and lubricants and are processed on

Among Exhibitors at the Plastics Exposition were *(Left to Right)* Monsanto Chemical Co; Bakelite Co.;

conventional vinyl equipment. Temperature control is a critical factor in processing of these blends.

E. L. Frants, Apex Electrical Mfg. Co., presided over the session on new materials, at which the following three papers were presented. The papers were followed by a showing of the Dow Corning Corp. film, **"What's a Silicone,"** illustrating the properties and applications of silicones.

"Research and Standards for the Plastics Industry," G. M. Kline, National Bureau of Standards. A significant part of the plastics research program must be aimed at advancing our knowledge of the fundamental relationships between polymer structure and properties. A dynamic program of research and engineering studies on plastics requires industry cooperation and teamwork, and should be planned and organized through an industry-supported plastics institute. Such an institute would serve as a source of basic technical information and provide specialized training in plastics.

"Expandable Polystyrene Beads—A Unique Plastic Material," E. A. Edberg, Koppers Co., Inc. Polystyrene foam made from expandable beads provides moldability, controllable density and shape, toughness, high strength-to-weight ratio, low thermal conductivity, and low water absorption. These beads, which contain the necessary blowing agent, can be expanded in heated molds to a variety of shapes and sizes in one operation and are not limited to processing into sheets or blocks.

"The Effects of Highly Intense Radiation Fields on the Synthesis and Physical Properties of High Polymers," D. S. Ballantine, Brookhaven National Laboratory. Studies of the effects of gamma rays on organic resin polymerization reactions indicate that such treatment offers no panacea for production problems. Plastics exposed to such rays, particularly vinyls, fluorocarbons, and methacrylates, show an increase in cross-linkings, while some plastics are degraded.

Wednesday, June 9

This session was devoted to "Refrigeration and Air Conditioning Applications of Plastics," with O. Yoxsimer, Westinghouse Electric Corp., presiding. Following the presentation of the three papers given below there was a panel discussion to answer questions from the floor. The panel members were Frank Deli, Amos Molded Plastics Division, Amos-Thompson Corp.; R. F. Hrudka, Chicago Molded Products Corp.; Desmond Marcy, Cleveland Plastics, Inc.; and A. N. Williams, General American Transportation Corp.

"Refrigeration and Air Conditioning Applications of Plastics," J. R. Hertzler, York Corp. The applications of plastics in refrigeration and air conditioning equipment were discussed. It was noted that plastics manufacturers and processors can help reduce the failure rate of plastic parts in air conditioners by giving careful consideration to material selection and the functional requirements of each application.

Pach Bros.

Gordon Brown

"Refrigeration Design with Plastics," R. E. Wallenbrock, International Harvester Co. The use of plastics in refrigerators is expected to double within 10 years. To help in this expansion, the industry needs better liaison between refrigeration engineers and plastics materials engineers; better grading methods, specifications, and industry standards for plastics; more complete technical data on plastics; and the development of techniques to improve fabrication methods on small runs. Plastic foams, reinforced polyesters, and post-formed sheets are of particular interest for the future.

"Potentialities of Plastics for Refrigerator Linings and Large Area Parts," E. T. Morton, Midwest Mfg. Co. From the refrigeration industry viewpoint, better cooperation is needed from plastics molders in design and application engineering problems. The use of plastics for any specific refrigeration application depends on cost, functional utility, and consumer acceptance.

Thursday, June 10

"Plastics Applications in Automobiles" was the subject of the Thursday session, at which W. J. McCortney, Chrysler Corp., presided, and the following five papers were presented:

"Automotive Plastics Applications," J. K. Totten, Ford Motor Co. Plastics use in the automotive industry depends on effective cost of a part, performance requirements, and styling potential. Successful applications include acrylics for lamp lenses, car tops, and medallions; cellulosics for knobs, steering wheels, arm-rest bases, and extruded trim; nylon for gears and bushings; polyethylene for wire insulation and leaf spring covers; vinyls for safety glass interlayer, wire insulation, upholstery, interior trim, and sealers; thermosets for insulators and components; and reinforced plastics for sport-car bodies.

"Cast Dies," R. H. Voss, Warren Plastics & Engineering, Inc. The use of cast phenolic dies and tooling was discussed in terms of actual applications, as illustrated by slides. The advantages and disadvantages of the phenolic dies were described in each application.

"Reinforced Plastics Tooling," Fred Lyijynen, Chrysler Corp. The use of plastics in automotive tooling has expanded tremendously from its slow start several years ago. Phenolics are widely used in spotting racks; while draw dies are made of polyesters reinforced with glass fiber. Other plastic tooling applications include hydroform dies, restrike dies, templates, stretch form block, and drill, checking, and other types of fixtures.

"Epoxy Plastic Dies, Die Models, Checking Fixtures, and Tooling," G. M. Rice, Ren-ite Plastics, Inc. The number of applications of plastics tooling is increasing steadily because of the material's better weight and cost factors and shorter fabrication time. Plastics are especially valuable for models and duplicates in design work; checking fixtures; spotting racks; and dies.

"The Corvette Plastic Body," J. G. Coffin, Chevrolet Division, General Motors Corp. This talk was a running commentary to a series of slides on the Corvette and other G-M plastic-bodies cars in both experimental and development stages at present.

SPI Officers Reelected

The election of officers and directors for 1954-55 featured the SPI annual meeting on June 8. All of the current officers were reelected, as follows: chairman of the board, Gordon Brown, Bakelite Co.; president, Mr. O'Connell; vice president, Earl R. Keown, Santay Corp.; and secretary-treasurer, Frank E. Selz, General American Transportation.

Exposition Highlights

This year's exposition was strictly an

Firestone Plastics Co.; and Naugatuck Chemical Division, United States Rubber Co.

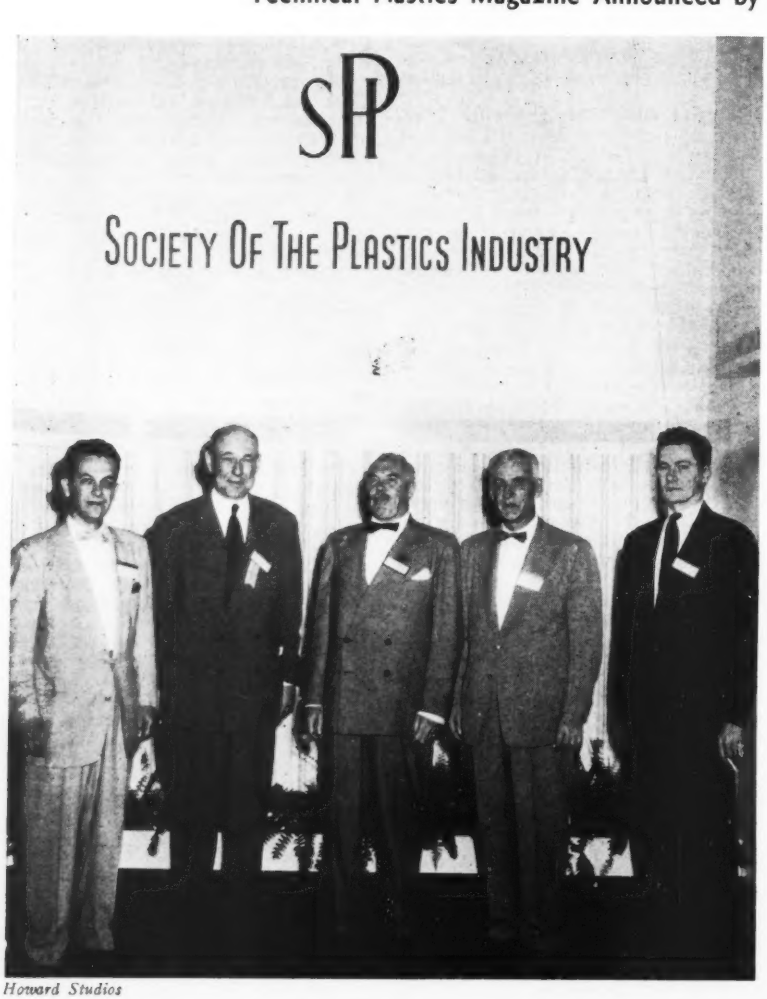
industrial show; most of the displays featured basic materials, machinery, and processing techniques and equipment. Unlike the past shows, this one had a dearth of packaging applications, toys, and other consumer end-product displays.

Exhibitors of new materials included G-E which showed its Irrathene irradiated polyethylene; Ferro Corp., with displays of new inorganic pigments for dry coloring nylon and fluorocarbons; Hooker Electrochemical Co., exhibiting its Hetron polyester resins; Bakelite Corp., with a new general-purpose styrene, a new acrylonitrile-styrene resin, and a new general-purpose phenolic; U. S. Industrial Chemicals, with five new Aropol polyester resins; Interchemical Corp., featuring its new vinyl foam, Vynafoam, for spray application; Reichhold Chemicals, Inc., with three additions to its line of Polylite polyester resins; Metal & Thermit Corp., showing vinyl stabilizers and a new flame retardant; Monsanto Chemical Co., with a new arc resistant Resinox; Borden Co., displaying a new general-purpose Durite molding compound; Chicago Molded Products Corp., with Campco sheet for vacuum forming; Coating Products, exhibiting a new metallized cellulose acetate butyrate sheeting; Bolta Products, with a new Boltaron series of vinyl sheet; and E. I. du Pont de Nemours & Co., Inc., showing its new Mylar polyester film.

All types of molding, fabricating, finishing, and handling equipment were on display at the show. Among the new items were a stepless temperature controller by West Instrument Corp.; a panel saw for acrylic and reinforced plastic panels, shown by Hendrick Mfg. Corp.; the Starv-Way injection machine feeder of Injection Molders Supply Co.; the scrap granulators exhibited by Foremost Machine Builders, Inc., and Van Dorn Iron Works Co.; vacuum forming machines shown by Auto-Vac Co. and Vacuum Forming Corp.; new injection molding machine models displayed in operation by Standard Tool Corp., Improved Machinery, Inc., Fellows Gear Shaper Co., Reed-Prentice Corp., Hydraulic Press Mfg. Co., Lester-Phoenix, Inc., and Moslo Machinery Co.; new compression presses shown by Elmes Engineering Division of American Steel Foundries, C. L. Goughler Machine Co., and Dake Engine Co.; and a constant tension winder for extrusions displayed by Hobbs Manufacturing Co.

New processing techniques and applications on display included the John Waldron Corp. Embrocade process for two-tone decorative embossing; nylon industrial parts molded by Nylon Molded Products Corp.; reinforced plastic fabricating by Regal Plastic Co., Fibre-Glass Molding Division of Apex Electrical Mfg. Co., General American Transportation, Molded Fiber Glass Body Co., Hille Engineering Corp., The Englander Co., and Russell Reinforced Plastics Corp.; epoxy resin structures shown by Shell Chemical Corp.; Tenco, Inc., with a complete line of rigid vinyl pipe fittings; explosion-vent windows of extruded butyrate shown by General Plastics Co.; and forming of rigid vinyl with conventional metal stamping equipment by B. F. Goodrich Chemical Co.

Technical Plastics Magazine Announced by Bill Brothers



Howard Studios

Edward Lyman Bill, President of Bill Brothers Publishing Corp., at the Recent SPI National Plastics Exposition: *(L. to R.)* Arthur M. Merrill, Editor of PLASTICS TECHNOLOGY; C. W. Blount, Vice President in Charge of Sales, Bakelite Co.; Mr. Bill; W. J. Geldard, Plastics Sales Manager, Naugatuck Chemical; and Rufus H. Fairchild, PT Advertising Manager

Bill Brothers Publishing Corp., publisher of RUBBER WORLD as well as of marketing and merchandising trade papers, has announced the publication, starting in September, of a new monthly magazine, PLASTICS TECHNOLOGY. The announcement was made by Edward Lyman Bill, president of Bill Brothers, at the recent National Plastics Exposition, held in Cleveland, O., on June 7-10, under the sponsorship of The Society of the Plastics Industry, Inc.

PLASTICS TECHNOLOGY will be devoted to the technical aspects of the plastics industry and will be edited from cover to cover for technical men in plastics development, research, production, management, and sales service. The new magazine is a further development of the "Plastics Technology" Department which has been a regular feature of RUBBER WORLD for the past nine years. In making the announcement, Mr. Bill assured the readers of RUBBER WORLD that they will still be serviced on the subject of plastics technology after the advent of the new magazine.

He also announced that the editor of PLASTICS TECHNOLOGY will be Arthur M. Merrill, former associate editor of RUBBER WORLD where he was in charge of the plastics technology department for more than eight years. Robert G. Seaman, editor of RUBBER WORLD, will continue in this position and also will assume the title of executive editor of the plastics magazine. Other staff additions for the plastics magazine, as well as detailed information on the coverage and scope of the new publication, will be given in the near future.

Plastics Research at MIT

A board survey of the usefulness of plastics as a material for housing will be the subject of a one-year research program now in organization stages at Massachusetts Institute of Technology, Cambridge, Mass. The project will be supported by a $10,000 grant from Monsanto Chemical Co. and will be supervised by a committee of five members of the MIT faculty.

SPE Sections Reports

Irradiated Polyethylene Discussed

A talk on "Irradiation of Polyethylene" by P. A. Goodwin, General Electric Co., featured the June 16 regular dinner-meeting, the last before the summer recess, of the New York Section, Society of Plastics Engineers. Some 90 members and guests attended the meeting, which was held in the Gotham Hotel, New York, N. Y., and included a cocktail hour and business session.

Irrathene 101, G-E's irradiated polyethylene, is the first industrial application of radiation chemistry, Mr. Goodwin declared. Made by bombarding polyethylene with high-energy electrons, Irrathene 101 has all the desirable properties of standard polyethylene plus outstanding resistance to stress cracking, and thermosetting properties (the material has been cross-linked and chars instead of melting).

The irradiated polyethylene is available only in pilot-plant quantities at present and only in the form of tapes. As the process is developed, the material is expected to become available in a wide range of film widths and thicknesses. Polyethylene cannot be irradiated before molding because the thermoset structure formed cannot be molded by standard plastic methods, the speaker noted.

Because of its combination of properties, Irrathene 101 is expected to open up new applications in such fields as electrical insulation, food packaging, drug packaging, protective coatings, and others. Above the normal melting point of polyethylene, Irrathene behaves like a vulcanized rubber in that it deforms, but does not flow. Although its strength above 110° C. is relatively low, the material has sufficient form stability for many uses.

Mr. Goodwin also reported briefly on the effects of electron irradiation on a wide range of plastics and rubbers, noting that some are improved; while others are degraded. Further work in this field is under way, and other industrial applications of irradiation can be expected in the future.

Table favors were distributed through the courtesy of Empire Brushes, Inc., and the meeting closed with a drawing for door prizes contributed by Washington Molding Corp.

Reinforced Plastic Group Formed

The New York Section is in process of forming a Reinforced Plastics Group as a division within the Section. Exploratory meetings with representatives of reinforced plastics companies have taken place, and an organizational meeting was held on June 23 at the Candelight Restaurant, Manhasset, L. I., N. Y.

An encouraging total of 150 members and guests attended the meeting, which included a cocktail hour, dinner, business session, and technical meeting. Carl Virgin, Naugatuck Chemical Division of United States Rubber Co., and acting chairman of the Group, presided over the business session. Guy Martinelli, Sylvan Plastics Co. and membership chairman of the New York Section, and Joseph Healey, Manco Products, Inc., and national membership chairman, spoke on the aims of the Society and the value of membership to plastics technologists. An invitation to the representatives of the reinforced plastics firms to join the Section was also extended by the president, Harold H. Schwartz, Empire Brushes, Inc., who introduced the other Section officers and directors.

A talk on "Horizons in Reinforced Plastics" by James A. Lunn, president of Lunn Laminates, Inc., featured the technical session. Mr. Lunn noted that reinforced plastics is still a small industry whose growth has been slowed by many technical problems. Few products made of reinforced plastics are actually in production at present. As production and other problems are solved, the industry can look for expanding markets and sales volumes in such products as aircraft parts, boats, guided missiles, helmets, corrugated sheet, trays and tote boxes, furniture, continuous laminated sheeting, pipe, truck parts, and other defense, industrial, and consumer items.

There was also a showing of the Zenith Plastics Co. sound-color film, "Futures Unlimited," dealing with the construction of airplane radomes and tail sections, furniture, and other products made of reinforced plastics. The meeting closed with a drawing for door prizes contributed by Empire Brushes.

Vacuum Forming at Chicago

"Vacuum Forming of Plastic Sheets" was the subject of an address delivered by Robert Butzko, of Auto-Vac Co., before a joint meeting of the Chicago Section, SPE, and the Midwest Chapter, SPI. The dinner-meeting, preceded by a cocktail hour, was held on May 19 and was attended by approximately 200 persons.

Mr. Butzko first described the two types of vacuum forming machines currently available: the drape forming unit and the straight vacuum unit. In the drape forming process, used primarily with male molds, the plastic sheet is clamped to a movable frame and drapes down on to the mold as heat is applied from an overhead panel and as vacuum is applied through the mold. In straight vacuum work, the sheet is clamped into a stationary frame and vacuum-drawn directly into a female mold.

Molds, formerly made of wood, are now usually constructed of plaster, aluminum (for long runs), or metal-sprayed plastic (for fine detail requirements), the speaker said.

Trimming of large parts can be done on clicker dies in toggle presses; while, for smaller parts, metal slitting saws on a jig are recommended.

Decoration of the finished article can be accomplished before or after forming, according to the speaker, with distorted printing of the sheet prior to forming indicated to be a substantial cost-saving procedure. Printing by silk screen is best for short-run operations, he contends, while lithographic plate printing is better for long runs.

Mr. Butzko cautioned that the economic advantage of vacuum forming over some other method of fabrication for a specific article may disappear when the method is applied to a different product, and *vice versa*, of course. He credited the rapid acceptance of the process during the past year to the introduction of new sheet materials with properties adaptable to such processing.

Buffalo Section Tours Brewery

The Buffalo Section of the SPE toured the Iroquois Beverage Corp. brewery to find out how beer and ale are produced and to sample the finished products. Some 50 members made the visit on May 21, following the process from the grinding and cooking of malt to the bottling operation. As is usually the case with such events, the tour terminated in the refreshment room.

O'Connell on Molders Management Problems

Approximately 90 members and guests attended the May 25 joint meeting of the Philadelphia Section, SPE, and Philadelphia Chapter, SPI, to hear John J. O'Connell, president of Consolidated Molded Products Corp., Scranton, Pa., and national president of the SPI, speak on some of the current problems faced by molders as viewed from the management level.

Mentioned as among such problems were the lack of capital as a result of high taxes, low profit margins, and rapid obsolescence and high cost of machinery; the unethical and destructive competition of some molders which has led to the issuance of "A Statement of Principles" by five major associations in the plastics field; and the lack of good management. On the last subject, Mr. O'Connell predicted that the day of the large molder was ending, and that an era of specialization, not only in the type of molding, but geographically as well, will replace it. A radius of 250 miles was suggested as a limit within which the molder could concentrate on his principal customer industries by having branch plants near them.

The increasing number of mergers and combinations which have been effected between companies is attributed, by the speaker, to the fact that the first period of dynamic growth within the industry has been completed. These consolidations, mergers, and outright purchases may offer a solution, however, to those problems of capital investment and geographic location previously discussed.

Mr. O'Connell also covered some of the programs undertaken by the SPI to solve many of current troubles within the industry, among them committees for establishment of standards and testing procedures, for disseminating information, for promoting better practices in plants, and for representing the industry to the government.

[1] India Rubber World, Apr., 1954, p. 89.

More Plastics in Refrigerators

The trend toward the use of plastics in refrigerators has been steadily growing from the negligible quantities used 10 years ago to the present time when as much as 25 pounds are used in a modern refrigerator. Most of the increased applications are being molded of polystyrenes, such as Monsanto's Lustrex resins, because of their toughness and high impact strength. Examples of such applications for styrene include breaker frames, door panels and liners, freezer compartments, and breaker strips. It is estimated that approximately 65% of the amount of plastics used in modern refrigerator units is made of this particular plastic.

Decorated Melamine Dishware

A process for producing decorated melamine plastic dishware, a product line claimed to be previously unobtainable in this country, has been developed by Einson-Freeman Co., Inc., Long Island City, N. Y. The new technique is described by the company, a lithographic firm, as using a melamine-impregnated overlay to produce the sealed-in decorative effect. It was devel-

(Continued on page 526)

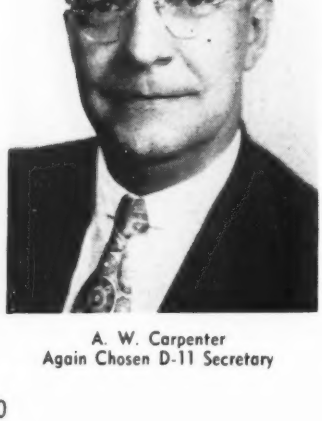
Scientific and Technical Activities

D-11 Men Honored at Annual ASTM Meeting in Chicago

R. A. Schatzel
Newly E'ected ASTM Vice President

The annual meeting of the American Society for Testing Materials, which was held in Chicago, Ill., during the week of June 14, at the Sherman and Morrison hotels, included meetings of Committee D-11 on Rubber and Rubber-Like Materials and Committee D-20 on Plastics. Men from both of these committees were honored by the Society at this meeting.

New officers of the Society introduced at the President's Luncheon on June 15 were as follows: president, Norman L. Mochel, Westinghouse Electric Corp.; vice president, R. A. Schatzel, Rome Cable Corp.; and members of the board of directors, E. J. Albert, Thwing-Albert Instrument Co.; John M. Campbell, General Motors Corp.; Paul V. Garin, Southern Pacific Co.; J. H. Jenkins, Forest Products Laboratories of Canada; and D. E. Parsons, National Bureau of Standards.



A. W. Carpenter
Again Chosen D-11 Secretary

Mr. Schatzel, vice president and director of engineering for Rome Cable, has been particularly active in Committee D-11 and was for many years chairman of subcommittee 5 on Insulated Wire and Cable. He has written many technical papers and holds numerous patents. He is a member of many other professional societies and has been on the editorial advisory board of RUBBER WORLD for a number of years.

Recipients of ASTM Awards of Merit at the President's Luncheon included O. M. Hayden, E. I. du Pont de Nemours & Co., Inc.; S. S. Kurtz, Jr., Sun Oil Co.; B. A. Anderton, Barrett Division of Allied Chemical & Dye Corp.; G. M. Kline, NBS.

The citation for Mr. Hayden read, " . . . for notable contributions to ASTM work on rubber and rubber-like materials, and for sustained leadership in the technical and administrative work of Committee D-11."

In the citation for Dr. Kline, it was said, " . . . for important and sustained contributions to research and standards for plastics, and for consistent leadership in the work of Committee D-20 on Plastics."

Dr. Kurtz, in his citation, was given credit for, " . . . extensive and valued service in the field of materials, and especially for support of standardization and research work on Committee D-2 on Petroleum Products and Lubricants."

Mr. Anderton was credited with, " . . . long and efficient service, especially on Committee D-4 on Road and Paving Materials, and for consistent support of much other ASTM technical and administrative work."

Committee D-11 Meeting

The meeting of Committee D-11 on June 17 had Chairman Simon Collier, Johns-Manville Corp., presiding, assisted by Secretary A. W. Carpenter, The B. F. Goodrich Co.

Mr. Collier first asked the members to stand in a moment of silent tribute to two members who had died since the last meeting, H. M. Frecker, United States Rubber Co., and H. Lawrence, American Standards Association.

It was announced that a new subcommittee on programs, symposia, etc. had been formed with H. G. Bimmerman, du Pont, as chairman, and approval for this action was granted.

The nominating committee for new officers of D-11, headed by L. V. Cooper, Firestone Tire & Rubber Co., announced that Mr. Collier and Mr. Carpenter had been renominated for their respective posts and that G. Maassen, R. T. Vanderbilt Co., had been nominated as a new member of the advisory committee. These men were elected by a unanimous voice vote, which also included reelection of present members of the advisory committee and of H. G. Bimmerman as vice chairman.

It was also announced that a new subcommittee on synthetic rubber should be formed in view of the desirability of being prepared to handle the work on existing specifications for government synthetic rubbers, when and if United States synthetic rubber production becomes a private-industry operation. Approval for such a subcommittee was granted.

The subcommittee on Nomenclature and Definitions, headed by Harry L. Fisher, University of Southern California, was instructed to proceed with the preparation for printing of the "Glossary of Terms Relating to Rubber and Rubber-Like Materials," using comments and suggestions received to date.

D-11 Subcommittee Meetings

Subcommittee 5—Wire and Cable. John T. Blake, Simplex Wire & Cable Co., chairman. Acting Chairman George W. Zink, Habirshaw Cable & Wire Division, Phelps Dodge Corp., in the absence of Dr. Blake, who is in Europe, announced that the results of the letter-ballot in D-11 on the revision of D470-52T, Methods of Testing Rubber Insulated Wire and Cable, was unanimous. The separate specification covering constructional details, which is intended to accompany D470-52T, received one negative vote, but this was not enough to prevent adoption of this specification also.

The letter-ballot in the subcommittee to reduce the specification for tensile strength of colored neoprene jackets in D752-49T, Specifications for Polychloroprene Sheath Compound, resulted in sufficient negative votes to reject this proposal for the time being.

D-11 Secretary Carpenter explained the proposed program of the new subcommittee 16, Classification and Specifications of Rubber Compounds. He said that subcommittee 5 and the other product subcommittees would be asked to submit to subcommittee 16 a tabulation of the rubber compounds covered in each product subcommittee, together with the various requirements and characteristics of these compounds. A task group will be appointed in subcommittee 5 to study this proposal.

A communication on the determination of insulation resistance was referred to a task group for possible incorporation in D257-52T, Electrical Resistance of Insulating Materials, with cross-reference in D470-52T.

Subcommittee 6—Packings. F. C. Thorn, Garlock Packing Co., chairman. The section on relaxation of commercial gasketing reported that the U. S. Bureau of Ordnance had decided to standardize on a six-hour test in the Farnum-Cole Relaxometer.[1] This work was done under contract at the University of Detroit, and subcommittee 6 is trying to have it made available to ASTM.

James D. Cole, Cole Electric Co., designer of the Relaxometer, is working on a new type of jig with a built-in load-sensing device that may improve the test method and overcome some of the objections reported in the Bureau of Ordnance work.

C. K. Chatten, New York Naval Shipyard, also described a special jig in which the restoration of initial strain is indicated by electrical resistance.

Considerable further work is required before an ASTM test method for relaxation of commercial gasketing can be developed.

Subcommittee 7—Rubber Latices. G. H. Barnes, Goodyear Tire & Rubber Co., chairman. The proposed method of test for the determination of the density

[1] India RUBBER WORLD, Mar. 1951, p. 679.

of natural rubber latex now before D-11 for addition to D1076-52T, Tentative Specifications and Tests for Concentrated, Ammonia-Preserved, Creamed and Centrifuged Natural Rubber Latex, was compared with a method before the International Standards Organization. Method A of the proposed ASTM density test is preferred and subcommittee 7 furnished information to the American delegate to the ISO/TC 45 meeting in London in June. A. E. Juve, of Goodrich, in this connection.

The test method for latex films was reviewed, and it was decided to await the suggestions of the British Standards Institution at the ISO/TC 45 meeting before proceeding further with work on this method.

It was voted to raise the specification standard for mechanical stability from 400 to 475 seconds and to ask D-11 to letter-ballot this change.

A report on sampling procedure for lots of latex in drums was submitted by a task group appointed in June, 1953. Differences between the recommended new ASTM method and the methods proposed by ISO TC 45 resulted in a decision not to make any recommendations to D-11 until after the ISO/TC 45 June meeting in London. The American delegate was given information with which to discuss this matter in London.

The present analytical methods in D1076 for the determination of copper and manganese should be replaced by the new methods being recommended by subcommittee 11 to D-11. Recommendation for letter-ballot in D-11 for inclusion in D1076 was made.

The results of a round-robin testing program for the determination of volatile fatty acids in latex as a measure of chemical stability were received. The method seems to offer a reproducible method of measuring at least one phase of chemical stability, and work will be continued on this method which originates with General Latex & Chemical Corp.

Subcommittee 10—Physical Testing. L. V. Cooper, chairman. This subcommittee did not hold a meeting, but the chairman reported that the wording change in D15-52T, Physical Testing of Rubber Products, recommended at the February, 1954, meeting had been approved in a subcommittee letter-ballot. The change is now recommended for letter-ballot in D-11.

Subcommittee 11—Chemical Analysis. W. P. Tyler, Goodrich, chairman. The revisions of the methods for the determination of copper and manganese in D297-50T, Chemical Analysis of Rubber Products, were reviewed and approved for letter-ballot in D-11. Work is continuing on a method for the determination of iron in crude rubber.

A task group to study at least two methods of determining carbon black in vulcanized rubber is being organized.

A task group will be appointed to prepare samples for further testing of the induction furnace combustion methods for the determination of sulfur, being worked on by several commercial laboratories.

It was suggested by D-11 Chairman Collier that a report be prepared covering the features of various infrared methods of analysis of elastomer mixtures for circulation in Committee D-11. Response to this report will be used to determine future action in this field by the subcommittee.

Subcommittee 12—Crude Natural Rubber. N. Bekkedahl, NBS, chairman. In a letter to the chairman of subcommittee 12, W. J. Sears, chairman of the Crude Rubber Committee of The Rubber Manufacturers Association, Inc., reported that during recent contacts in the Far East with natural rubber research institutes he was continually asked the question, "What does the U. S. manufacturer want in natural rubber?" Mr. Sears expressed the opinion that subcommittee 12 is particularly well qualified to consider this question and to establish better liaison between technicians in the consuming industry and those in the producing industry in the Far East and to make tentative recommendations. Subcommittee 12 appreciates this evidence of world-wide interest in its work.

A task group was appointed with Mr. Juve as chairman to study the vulcanization characteristics of natural rubber. The Mooney viscometer method will be used, and an attempt made to see if this method will provide adequate and reproducible information. The three grades of Technically Classified Rubber will be employed in a round-robin testing program in which seven laboratories have volunteered to participate.

Subcommittee 14—Abrasion Tests. R. F. Tener, NBS, chairman. The results of a questionnaire circulated within the subcommittee to determine the type of abrasive and procedure for obtaining it for use in connection with D394-47, Abrasion Resistance of Rubber Compounds, were summarized as follows:

(1) The two major difficulties encountered with abrasives are non-uniformity and smearing.

(2) Cutting rate is important, but neither a fast- nor a slow-cutting abrasive is desired.

(3) A small majority of the respondents favored a commercial abrasive rather than the establishment of a specially prepared abrasive.

(4) Those few expressing an opinion regarding criteria of acceptance for an abrasive favored standardizing the abrasive against a standard reference material.

The special batch of abrasive paper made at the request of ISO/TC 45 by the Minnesota Mining & Manufacturing Co. in England appears better in constancy of cutting, and the initial sharpness is less but rate of fall of lots is slower than "Tri-Mite" paper, which is the company's current commercial product.

The paper for the ISO is not so good as expected and inferior to the abrasive the company was requested to match, particularly for testing low-grade rubber compounds. It is more satisfactory for tire tread compounds. The manufacturer can do nothing more to improve uniformity, but will guarantee that the ISO paper is carefully selected and maintained at its present level of quality.

It was the opinion of the subcommittee that the ISO abrasive paper project should be closely followed, and that some smaller manufacturer of abrasive papers be contacted for suggestions and recommendations for a standard abrasive paper for rubber testing.

Subcommittee 15—Life Tests. G. C. Maassen, chairman. No meeting of this subcommittee was held, but Mr. Juve reported for Mr. Maassen that the editorial changes in D865-52T, Heat Aging of Vulcanized Natural and Synthetic Rubber by the Test Tube Method, to permit the use of aluminum black heaters constitutes more than just the usual request to D-11 to make an editorial change. The subcommittee therefore recommended revisions of D865-52T, with special reference to paragraphs 4 and 8.

Subcommittee 16—Classification and Specifications of Rubber Compounds. J. F. Kerscher, Goodyear, chairman. The chairman reviewed the actions taken at the first meeting of this subcommittee, at which its scope had been agreed upon and a task group appointed to work out means of undertaking the problem assigned to the subcommittee.

J. J. Allen, Firestone, acting secretary of the task group, reported on a meeting held May 17. Since the Netherlands delegation to ISO/TC 45 has in existence a specification identified as N 1001 for classifying rubber compounds, it was used

O. M. Hayden
Recipient of ASTM Award of Merit

as a basis for discussion in comparison with ASTM D735-52aT, Specifications for Rubber and Synthetic Rubber Compounds for Automotive and Aeronautical Applications. A report which showed the Dutch ideas of the advantages and disadvantages of both systems was also discussed.

The task group made its final recommendations, as follows:

(1) Any new specification or expansion of D735 should make use of tables.

(2) The tables in the new specification should be prepared in terms of end-products.

(3) The various D-11 subcommittees representing other branches of the rubber industry, with the exception of automotive, should prepare their own specifications in tabular form showing desired physical properties and limits. These should then be submitted to subcommittee 16, which will act as a clearing house and develop the several tables into one broad specification.

Simon Collier
Again Heads Committee D-11

In so doing, prefix and suffix letters should be kept as consistent as possible.

In the discussion which followed the task group's report it was emphasized that the first reason for the subcommittee's project is to simplify testing for various products, and the second reason was to reduce the number of commercial compounds in use. Cooperation from other D-11 subcommittees is essential for the success of the project.

The three recommendations of the task group were approved by subcommittee 16 as a recommendation to D-11.

Subcommittee 16 advised the American representative to ISO/TC 45 Working Group 6 meeting in London in late June of the American position as follows:

(1) We are not prepared at present to suggest what ISO/TC 45 WG 6 should do about its proposed method of classifying rubber products.

(2) We do not agree with the WG 6 system of numerals and symbols which permits putting together any combination of properties in a compound identification regardless of the practicability or possibility of such a compound ever being usable.

(3) We believe in a classification system prepared in tabular form listing essential properties and indicating values of other properties which must be accepted since they are in line with the essential properties.

We believe the function of such a tabulation is to guide the design engineer with reference to what is available, practical, and usable for his purpose.

(4) ASTM Committee D-11 subcommittee 16 is actively studying the preparation of a specification covering a broader application of rubber in fields not covered by D735, which is limited to automotive uses.

Subcommittee 17—Hardness, Set and Creep. S. R. Doner, Raybestos-Manhattan, Inc. J. R. Britt, Sponge Rubber Products Co., has agreed to continue to coordinate the work of ISO/TC 45 on compression set with the work of ASTM.

The section on durometer hardness *versus* the ISO hardness scale is planning a program to determine which method is the most reproducible for testing a variety of elastomer stocks. The proposed program will be reviewed by subcommittee 28 on statistical methods before any work is begun.

A section will be established for standardization work on the Shore D durometer, which is used for testing stocks of more than 95 Shore A durometer.

The section on stress-relaxation submitted a bibliography on "Creep and Relaxation of Elastomers," together with results of tests on 30 GR-S samples and illustrations of the equipment used. Additional help in carrying on some of the preliminary work before undertaking a full-scale program was obtained.

A new German durometer called "Quick" and competitive with the Shore A durometer was announced by F. J. Holler, W. J. Hacker & Co., Inc., New York, N. Y. A hardness testing instrument similar to the Pusey & Jones plastometer is also available from this company.

A new Rex hardness gage made with a dial indicator in place of the previous friction scale was also exhibited.

Subcommittee 18—Flexing Tests. B. S. Garvey, Jr., Sharples Chemicals, Inc., chairman. The subcommittee chairman urged any one actively interested in working on the improvement of ASTM flexing tests to notify him if willing and able to work on cooperative test programs for improving the methods for the de Mattia machine or if able to submit some other test sufficiently developed for consideration.

A section appointed to study the use of the de Mattia machine, D430-51T, Method B, Dynamic Testing for Ply Separation and Cracking of Rubber Products, outdoors or in an ozone cabinet, reported only moderate interest and offers of limited cooperation in response to requests for help. It was the opinion of the subcommittee that unless more interest in the project is indicated, no further work should be done on the procedure.

Method D813-52T, Resistance of Vulcanized Rubber or Synthetic Elastomers to Crack Growth, was reviewed in a paper by B. G. Labbe, University of Akron Government Laboratories, and also in comments by letter from Mr. Maassen. A second ISO/TC 45 cross-testing program has been completed. A jig for punching the specimen for this test is available from National Rubber Machinery Co., Akron, O.

While the procedure is fairly well established, the precision attained within a single laboratory and between laboratories is poor. A number of known variables should be investigated further if this test is to be improved. Unless sufficient interest is evidenced in doing further cooperative laboratory work, no further changes will be made in D813.

Since the report a year ago of the first ISO/TC 45 cooperative test program on flexing, a second cooperative program has been completed, and J. M. Buist, Imperial Chemical Industries, Ltd., England, proposes to publish a paper incorporating the results of the two programs.

A second draft of the proposed ISO/TC 45 procedure for flexing has been submitted. Except for minor details it differs from the first draft, previously reported to this subcommittee, only in decrease in the free length from 3¼ to three inches.

Subcommittee 20—Adhesion Tests. H. H. Irvin, Marbon Corp., chairman. The results of the round-robin test program for the revision of D429-47T, Method B, Adhesion of Vulcanized Rubber to Metal, were discussed, and these results, together with the questions that developed, will be forwarded to the subcommittee 28 on statistical methods. Comments from subcommittee 28 on the significance of these test results will be circulated, when received, by subcommittee 20 for comment from its members.

It was agreed that the above procedure should be followed also for the test program aimed at revision of D429, Method A. Information regarding the variables involved will be furnished subcommittee 28 for its suggestions regarding the proper design of a valid test program. Both the thickness of the rubber section and the area of the test piece are included in the items planned for revision.

The American delegate to the ISO/TC 45 London conference, in late June, was given copies of the proposed revisions of D429 Methods A and B and requested to ask that ISO/TC 45 await the results of the current work on revisions for D429 rather than adopt what are essentially the current D429 methods.

It was the opinion of subcommittee 20 that no real use was apparent at the moment for a dynamic test to check adhesion. It was felt that bond qualities considered satisfactory as a result of testing by D429 standards would not differ materially if tested by any now-known dynamic test. Comments to the contrary will be welcomed by the chairman of subcommittee 20.

Subcommittee 21—Cements and Related Products. J. F. Anderson, Goodrich, chairman. The task group working on the impact machine method of testing metal-to-metal bonds did not make a report, but it was revealed that recent work under the direction of A. J. Kearfott, General Motors, chairman of this task group, showed close conformance to the method used by Committee D-14. The chairman of subcommittee 21 will try to obtain a recommendation from Mr. Kearfott that the Committee D-14 method be included as a recommended method in D1205-53T, Test for Brake Lining Adhesive and Other Friction Materials.

The bend test for friction materials bonded to metal was explained, and it appears to be a satisfactory method for inclusion in D1205-53T. The method will be circulated in a letter-ballot recommending its adoption and its inclusion in D1205-53T.

The new method for testing wet film thickness with an instrument made by Gardner Laboratories was described. The method seems satisfactory, but members of the subcommittee were asked to submit other methods of gaging wet films and to comment on the above method.

The request by the Bureau of Ships for a quick test for determining shelf life of neoprene cements appears to be answered best by recommending a method now before Committee D-14 for adoption as standard.

An inquiry as to the method of coating or applying wet cement films onto ASTM buttons in D1205-53T appears to be a matter for agreement between supplier and consumer in their laboratories and since General Motors Research has studied this matter thoroughly, it will be asked for its recommendations.

Subcommittee 23—Hard Rubber. C. P. Morgan, Vulcanized Rubber & Plastics Co., chairman. In connection with the continuing discussion of the equipment for the drop-ball method of testing asphalt containers, prints on construction of the apparatus were provided, and information regarding costs is to be obtained.

Methods used for determining failure in the hot-cold cycle-test procedure for asphalt containers were discussed, and it was decided to check these methods further before submitting revisions to D639-52T, Testing of Asphalt Composition Battery Containers, to D-11. A task group was appointed for this work.

Results of acid absorption tests using the proposed new edge coating material indicate that a good seal of the cut edges of the specimens is being obtained, but that the tests were conducted without a controlled sampling procedure, and the results were therefore not completely satisfactory. This task group will prepare a standard set of samples for further testing in various laboratories using the proposed test method and sealing material.

The drop-ball method for impact resistance of hard rubber products proposed as an alternate impact test procedure in D530-50T, Testing Hard Rubber Products, appears to require further revision and will be reedited and again submitted to subcommittee members for approval.

Further investigation of the proposed analytical procedure for the determination of soluble iron in hard rubber by various laboratories is to be requested, and comments regarding inclusion in D530 will be solicited.

A final report on the use of an extensometer for the determination of the elongation of hard rubber will be submitted by the subcommittee chairman at the next meeting.

Subcommittee 24—Coated Fabrics. J. A. Williams, Haartz-Mason, Inc., chairman. The test methods in D751-52T, Testing Rubber Coated Fabrics, were reviewed, and with the exception of adhesion testing, the subcommittee was in agreement with the procedures in their present form.

A questionnaire covering points requiring further study in connection with adhesion testing will be circulated in the subcommittee.

Present ASTM procedures for light aging, oxygen bomb aging, oven and air pressure heat aging, with regard to testing coated fabrics were discussed, and it was agreed that these methods were generally applicable, but that a better means of evaluating the end-point should be studied.

It was further agreed that cold cracking, plasticizer loss, and stiffness measurements of synthetic elastomers should be studied in cooperation with Committee D-20 on Plastics.

A test method for scrub testing of coated fabrics utilizing the equipment described in the R. T. Vanderbilt Co. Handbook is to be investigated at the request of the committee on aeronautical fabrics of the Society of Automotive Engineers.

The test section on abrasion testing reported the need of further work with both the Stoll and Schiefer machines. The work of Committee D-13 on Textiles will be reviewed in this connection.

Subcommittee 25 — Low-Temperature Tests. R. S. Havenhill, St. Joseph Lead Co., chairman. A request that the temperature for maximum crystallization rate be changed in D832-46T, Recommended Practice for Conditioning of Rubber and Plastic Materials for Low-Temperature Testing, resulted in the appointment of a task group to revise the method and to give consideration to the inclusion of constructional details for a constant-temperature liquid testing bath.

Mr. Juve recommended that standard test temperatures of —55, —40, —25, —10, and 23° C. be incorporated in this revision.

Section 4 and 4L of the ASTM-SAE Technical Committee on Automotive Rubber requested that D736-46T, Test for Low-Temperature Brittleness on Rubber and Rubber-Like Materials, be revised to specify a standard exposure period of five hours. This action deletes the 96-hour exposure period for natural rubber. The revision was recommended for letter-ballot in D-11.

The highlights of the recent Third Armed Forces Symposium were reported as follows:

(1) D736 will not be used in future military procurement specifications.

(2) The necessity of proper modification of the Gehman test to insure uniform control of test temperature was emphasized.

(3) The necessity that certain conditions be met and techniques be followed with regard to minimum size, location of lights, air circulation, handling, etc., for proper use of cold boxes was also emphasized.

Subcommittee on Standard Samples. A. E. Juve, chairman. At a meeting in March this subcommittee considered reactivating the program of establishing the balance of standard compounding ingredients required to prepare the standard formulations now incorporated in D15-52T.

Because of the limited funds available at NBS for standard sample work it was decided to approach the suppliers of the various ingredients not yet standardized to see if they would donate the materials for this program. To date favorable replies have been received from the following companies: Godfrey L. Cabot Co., conducting black; Columbia-Southern Chemical Corp., whiting and Silene EF; du Pont, neoprene; and B. F. Goodrich Chemical Co., nitrile rubber. NBS is proceeding with the necessary arrangements and tests to set up standard lots of these materials.

Certain changes in standard formulations were discussed including the following:

(1) Change the acetylene black used in electrically conducting natural rubber stock to a conducting furnace black such as Vulcan C.

(2) Change the neoprene from Type GN to Type W or WRT.

(3) Change the GR-S recipes from 122° F. to LTP type.

It was also suggested that the subcommittee consider the addition of recipes loaded with HAF black based on both natural rubber and GR-S. NBS has added as a standard for testing work in the Government Synthetic Rubber Program a standard HAF black designated as standard sample No. 378.

A final report on these changes is contemplated for the next meeting of D-11.

Special Task Group on Standard Test Temperatures—A. E. Juve, chairman. A series of standard test temperatures has been developed and incorporated into a tentative method. The proposed method was offered for letter-ballot in D-11.

In conection with this proposal, the following points were made:

(1) Where non-standard test temperatures are now employed, changes to standard temperatures need not be made unless it is felt advantageous to do so.

(2) New methods may employ non-standard temperatures when conditions warrant it. When new methods are written, however, the series of standard temperatures should be consulted, and standard temperatures specified when possible.

(3) It is recommended that throughout D-11 methods all temperatures be shown both in Centrigrade and Fahrenheit units.

The Tentative Recommended Practice for Standard Test Temperatures for Rubber Products states that this recommended practice applies to testing temperature or temperatures to be employed for the testing of rubber products in those instances in which the particular method refers to this method.

The following is a list of standard test temperatures:

°C.	°F.
—55	—67
—40	—40
—25	—13
—10	+14
23	73.4
50	122
70	158
100	212
125	257
150	302
175	347
200	392
250	482

Tolerances for the test temperature, unless otherwise specified in the particular method, shall be ±2° C. or 3.6° F. This tolerance is the maximum allowable variation in the temperature of the space enclosing the specimens being tested.

SAE-ASTM Technical Committee on Automotive Rubber

The Technical Committee had two meetings since the February, 1954, meeting of D-11, one in Detroit on March 10 and one in Chicago on June 15.

J. J. Allen, Firestone, secretary of the Technical Committee, reported that the following actions were approved by letter-ballot of the Committee:

(1) A revision of the specification for SAE V-belts and pulleys was approved and has been accepted by SAE.

(2) A recommended practice for V-belt drives was approved and accepted by SAE.

(3) A revision of ASTM D735 and SAE 10R changing the elongation values for the 80 durometer stocks in Table I, Class R, was approved. This revision is now being letter-balloted in D-11 and has been referred to SAE for its action.

(4) A revision of ASTM D735 and SAE 10R replacing the suffix letter K (adhesion test required) to K_1 (adhesion test required, elastomer to metal bond made during vulcanization process) and K_2 (adhesion test required, cemented bond, made after vulcanization process) was approved and is now being referred to D-11 and SAE for appropriate action.

In this connection, a recommendation was made that a footnote be added that it may be necessary to cement a strip of rubber to some other material some days after manufacture. Therefore materials which might bloom and interfere with the adhesion should be avoided in the rubber compound.

(5) The addition of six more grades of gasket materials to D1170 and SAE 90R were approved by letter-ballot. Action on approval was held up momentarily with the hope of rewriting and simplifying the entire specification until Section 10 advised that this job would take two years. Approval was therefore given to pass this revision on to D-11 and SAE for suitable action and incorporation in the specifications.

(6) A letter ballot approved the revision of the by-laws of the Technical Committee to add the advisory committee as a permanent administrative committte.

Major activities of the several sections of the Technical Committee were reported as follows:

Section 1 on Vibration Insulators has compiled the results of a round-robin study of tests for resilience and hysteresis made with the Yerzley oscillograph. The results varied appreciably, and causes of these variations are now being studied.

Section 3 on Automotive Hose has prepared several revisions of SAE 20R on coolant hose. When approved, they will be submitted to letter-ballot of Tech. A. A proposed specification for power steering hose is being developed. Some changes in the 40 R-1 hydraulic brake hose specification are being considered.

Section 4 on Classification and Specifications of Automotive Rubber Compounds announced that its activities have resulted in the letter-ballot actions (D735) already reported.

Section 9 on Hydraulic Brake Cups is working on the addition of a specification for a master brake cylinder cup, a change in the present cold test, and a corrosion test to SAE Specification 60-R-2.

Section 10 is considering the overall revision and simplification of the present gasket specification.

Section 11 is considering further revisions to improve the specifications for oil seals.

Section 13 on Finish Standards has reached the stage in its work where certain typical mold items are being selected, and the proposed finish specification will be applied to blueprints.

Section 14 on Automotive Mats is considering specifying fadeometer and weathering tests for vinyl coated mats, a means of measuring abrasion, methods of making a water spotting test, and a method for cleanability.

Next D-11 Meeting in Cincinnati

The next meeting of D-11 will be held in Cincinnati, O., the week of January 31, 1955, with the parent Society. The annual ASTM meeting is scheduled for Atlantic City, N. J., late in June.

Rubber & Plastics Division, ASME, Pittsburgh Meeting

The Rubber & Plastics Division of the American Society of Mechanical Engineers held a one-day meeting in Pittsburgh, Pa., at the William Penn Hotel, on June 22, as a part of the semi-annual meeting of the Society.

A luncheon meeting of the executive, advisory, and general committees of the Division on the same day was presided over by Allen Gifford, Lord Mfg. Co., chairman of the Division.

The Division meeting consisted of two technical sessions, one on plastics and one on rubber. The latter was in the form of a symposium on rubber O-rings.

Technical Session 1

The chairman for the first technical session on plastics was Maurice Morton, University of Akron, and the vice chairman was Daniel T. Downes, Pittsburgh Plate Glass Co.

"Dielectric Breakdown Properties of Thermosetting Laminates," by Norman A. Skow, Synthane Corp., was the first paper. Dr. Skow explained that thermosetting laminated plastics are used extensively for electrical insulation because of their unusual combination of electrical, mechanical, and chemical properties.

To establish safe operating loads, tests for the endurance limits of dielectric strength were run on each of several grades of thermosetting plastic laminates, plotting voltages against time. The data thus obtained indicate that for a given thickness and atmospheric condition, a maximum voltage exists below which failure will not occur. Tests of this type yield results which are valuable to the design engineer in determining the proper grade and thickness of material for use as insulating parts in electrical equipment.

"Impact Plastics with Responsibilities," by Paul E. Fina, Fiberite Corp., reviewed the basic resins and fillers used for the manufacture of reinforced plastics products. Some comments regarding molding and fabricating conditions were made.

The author emphasized that the paper had been prepared with the thought of encouraging incentive for the use of properly engineered impact thermosetting plastics. Some factors for the use of such plastics in place of other materials were given, and it was stated that future impact plastics will fill the need of quality products replacing those made from wood, metals, etc.

A good exhibit of products made from impact plastics was explained by Mr. Fina.

"Weather Aging of Styrene and Phenolic Plastics," by C. Howard Adams and J. R. Taylor, both of Monsanto Chemical Co., was the final paper of this session. Commercial styrene and phenolic plastics were exposed outdoors for four years in Arizona, Florida, and Massachusetts.

Pigmentation markedly improved the weathering resistance of styrene plastics. Arizona with its high ultra-violet radiation intensity was the most severe location for styrene. The semi-tropical weather of Florida did the most damage to the phenolic plastic.

All weather data for each exposure site were obtained from the nearest U. S. Weather Bureau Station. The exposed specimens were tested, where possible, in accordance with standard procedure of the American Society for Testing Materials.

Technical Session 2

The chairman for the second session, on rubber, was Walter Tepper, Martin Rubber Co. He was assisted by Edward T. Wanderer, Aluminum Co. of America, as vice chairman.

"Designing with O-Ring Seals," by David R. Pearl, Hamilton Standard Division, United Aircraft Corp., was the first paper of this session. Two basic principles in using O-ring seals were explained in that the seal must be precompressed and the volume of the groove into which the O-ring is used must be bigger than the seal. Sliding and rotating O-ring seals may show some leakage, which increases with piston velocity, it was said.

Failure of O-ring seals is most often due to extrusion into the gap between the piston and cylinder wall in this type of application. It was added that O-ring seals are not recommended for high-speed pump seals because of the amount of sliding friction involved.

Design factors important with O-ring applications were detailed, including such items as the necessity of determining precompression and then fluid pressure and the importance of precompression and nonconfinement of the O-ring when a seal.

"Compounding Principles Involved in the Production of O-Rings," by Douglas S. Messenger, Garlock Packing Co., was the second paper of the rubber session. Many of the compounding principles considered in this paper applied to O-ring compounds employing nitrile rubber as the base material because many of the requirements for O-rings can be best fulfilled by such compounds.

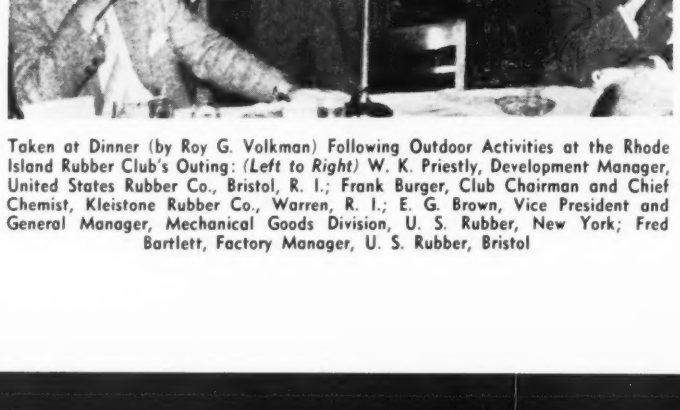
Media against which O-rings operate were mentioned, and a list of requirements for suitable compounds was given. A study of volume change characteristics of plasticized nitrile rubber compounds having varying acrylonitrile content in several typical media was presented. Other compounding ingredients and their place and purpose in O-ring compounds were discussed.

The main purpose of this paper was to consider compounding principles for O-rings and to present compounds recommended for specific purposes so that no finished compounds were given.

"Swelling and Drying of Fuel O-Rings," by R. A. Clark and R. M. Kell, Battelle Memorial Institute, was the final paper on the program. The purpose of the investigation reported in this paper was to shorten a fuel O-ring test procedure by using temperatures up to 250° F. to accelerate the rates of O-ring swelling and drying.

It was found that the swell of the commercial O-rings tested was accelerated by advancing the temperature with very little effect on the maximum or final swell obtained. Likewise, increasing the temperature speeded up drying, with little effect on final volume. The physical properties of O-rings treated at 250° F., by swelling and drying to equilibrium conditions, were comparable in most respects to O-rings given similar (though longer) treatment at 160 or 212° F.

The authors suggested that the rate of testing of fuel O-rings can be accelerated by using 250° F. as a test temperature, but added that this statement does not imply that O-rings tested in this manner are necessarily satisfactory for extended use at this temperature.



Taken at Dinner (by Roy G. Volkman) Following Outdoor Activities at the Rhode Island Rubber Club's Outing: *(Left to Right)* W. K. Priestly, Development Manager, United States Rubber Co., Bristol, R. I.; Frank Burger, Club Chairman and Chief Chemist, Kleistone Rubber Co., Warren, R. I.; E. G. Brown, Vice President and General Manager, Mechanical Goods Division, U. S. Rubber, New York; Fred Bartlett, Factory Manager, U. S. Rubber, Bristol

Record Attendance at Rhode Island Rubber Club Outing

The fifteenth annual outing and golf tournament of the Rhode Island Rubber Group saw a record turnout of 262 members and guests take part in the various activities. Fine weather helping, the golf tournament drew 130 competitors in 10 events, awards for which were distributed after the roast beef dinner.

The Group, which believes it is the fastest growing such unit in this country, was honored by the attendance of E. G. Brown, vice president of United States Rubber Co. and first chairman of the club.

In addition to door prizes, which were contributed by a number of companies, first prizes in the golf awards were presented to the following: low gross, Fred Newman of Respro; low net, Gene Evans, of Sessions-Gifford; blind bogey, Joe Jacinto, of Collyer Wire; nearest to the pin on three holes, Paul Thompson, of U. S. Rubber; high gross, Joe Cullen, of Marbon; high net, Larry Batty, of General Electric; longest drive, Fred Newman; putting, S. Griffin, of E. I. du Pont; and most sixes, A. F. Chiulli, of Randolph Mfg. The guest prize for lowest gross score was given to Phil Solomon, of Hardesty Chemical Co.

Additional Experimental GR-S Polymers and Latices Announced

The additions and changes in the list of experimental GR-S polymers and latices authorized by the Office of Synthetic Rubber, Reconstruction Finance Corp., during the period from January 1 to May 31, 1954, are given in the table below.

In addition, there was made public the following list of currently available active experimental polymers, availability of which should be ascertained at the time of ordering by inquiring of the sales division of OSR: GR-S latices—X-617, -633, -667, -684, -710, -711, -734, -758, and -760; and GR-S solid polymers—X-757, -759, -762, and -763.

Normally, experimental polymers will be produced only at the request of the consumers, and 20 bales (one bale weighs approximately 75 pounds) of the original run will be set aside, if possible, for distribution to other interested companies for their evaluation. The 20 bales, when available, will be distributed in quantities of one bale or two bales upon request to the OSR sales division, or will be held for six months after the experimental polymer was produced, unless otherwise consigned before that time. Subsequent production runs will be made if sufficient requests are received.

All of these new polymers are experimental only, and the OSR does not make any representations or warranties of any kind, express or implied, as to the specifications or properties of such experimental polymers, or the results to be obtained from their use.

X-NUMBER DESIGNATION	POLYMER DESCRIPTION	REMARKS
X-759 GR-S	Butadiene/styrene charge ratio 70/30, adjusted to yield 23.5/1.0% bound styrene; hydroperoxide-sugar activated; fatty acid soap emulsified; 122° F. reaction temperature; 68% conversion; carbamate shortstopped; staining antioxidant; salt-acid coagulated; and Mooney viscosity at 212° F., 44-53 ML-4.	Identical with GR-S 1000 except for activation and shortstop ingredient. Results of consumers' evaluation will determine whether activated recipe will be adopted for all "hot" polymers.
X-760 GR-S Latex	Butadiene/styrene charge ratio 70/30, adjusted to yield 25.0/2.0% bound styrene; sulfoxylate activated; 65/35 rosin/fatty acid soap emulsified; 50° F. reaction temperature; 60% conversion; carbamate shortstopped; potassium oleate stabilized; and mean Mooney viscosity of contained polymer at 212° F., 140 ML-4. Latex heat concentrated to 47.0–50.0% total solids.	Identical with GR-S X-758 except for lower total solids range. This latex was developed as a possible replacement for GR-S 2100.
X-761 GR-S	Butadiene/styrene charge ratio 70/30 adjusted to yield 23.5/1.0% bound styrene; sugar-free iron activated; rosin acid soap emulsified; 41° F. reaction temperature; 60% conversion; carbamate shortstopped; staining antioxidant; salt-acid coagulated; and Mooney viscosity at 212° F., 46-58 ML-4.	Identical with GR-S 1500 except that this polymer is produced under specially controlled conditions for use by GR-S producing plants as the standard reference control test bale.
X-762 GR-S	Butadiene/styrene charge ratio 70/30 adjusted to yield 23.5/1.0% bound styrene; sugar-free iron activated; 50/50 rosin/fatty acid soap emulsified; 41° F. reaction temperature; 60% conversion; carbamate shortstopped; staining antioxidant; salt-acid coagulated; and Mooney viscosity at 212° F., 46-58 ML-4.	Identical with GR-S 1500 except that it employs a different emulsifying agent.
X-763 GR-S	A masterbatch of 37.5 parts aromatic-type processing oil, 50 parts HAF black, and 100 parts base polymer. The polymer is 23.5% bound styrene; sugar-free iron activated; 50/50 rosin/fatty acid soap emulsified; 41° F. reaction temperature; 60% conversion; carbamate shortstopped; staining antioxidant; and salt-acid coagulated. The compounded masterbatch has a Mooney viscosity at 212° F. of 55-75 ML-4.	Identical with GR-S 1801 except that it contains 37.5 parts aromatic-type oil instead of 25 parts naphthenic-type oil. It is a possible replacement for GR-S 1801.

Elastomer and Plastics Symposium

The third annual Short-Talks Symposium of the Elastomer & Plastics Group, Northeastern Section, A. C. S. was held May 18 at Massachusetts Institute of Technology, Cambridge, Mass. The gathering attracted some 60 members and guests. Charles S. Frary, Jr., Boston Woven Hose & Rubber Co., acted as symposium chairman and introduced the five speakers.

"Recent Developments in the Waterproof and Canvas Shoe Industry" was the subject of a talk delivered by Bernard H. Capen, of Tyer Rubber Co. Mr. Capen outlined the various operations used in manufacturing shoes and discussed the future, which, he said, held considerable changes for the industry. In particular, the development of cast vinyl plastisol shoes, having sponge between the layers, and of dipped latex shoes with similar construction, will probably result in the entrance of the industry into the latex and plastisol businesses.

"Blocking Tester for Flexible Sheet Materials," the paper given by R. E. Hubbard, of Dennison Mfg. Co., described with slides the functioning of this machine. So successful was this device, he explained, that it was used for setting up acceptance tests for coating materials such as vinyl latex and for evaluating the effect on blocking of plasticizers.

Irving Kahn, of the plastics and adhesives branch, Ordnance Materials Research Office at Watertown Arsenal, spoke on **"New Antioxidants for GR-S."** Mr. Kahn, after discussing the effects on tires of deterioration from ozone, stated that a formulation of low styrene GR-S polymers made at 41° F. with additives of the symmetrical, substituted benzidine type and three parts wax, proved to exhibit the best resistance to ozone.

"Specialty Polymer Latices," a talk by Max Taitel, of Union Bay State Chemical Co., covered the new line of synthetic polymer latex dispersions ("Ubatols") recently introduced by the company. The unique properties of these dispersions center around the characteristics of extremely small particle size (0.03-micron), high degree of mechanical stability, and remarkable freeze-thaw stability.

The final speaker of the evening, Donald Wright, of Hood Rubber Co., dealt with the **"Determination of Tackiness of Rubber-like Polymers Using the Du Nouy Tensiometer."** He covered the history of the instrument and described the four methods that had been developed to evaluate the factors of "stick" and "tack." The present procedure employed, and some of the results thereby obtained for GR-S types, plasticizers, etc., were also explained to the audience.

Golf at Fort Wayne

The third annual golf outing of the Fort Wayne Rubber & Plastics Group was held June 11 at the Tippecanoe Lake Country Club, Leesburg, Ind. Those among the 166 members in attendance who were not golfers participated in horseshoe pitching contests or baseball games, or cooled off in the lake.

It was announced that Howard Rapp (Belden Mfg. Co.) will be the chairman of the Group for the coming year. Other officers, also to be installed in September, are vice chairman, Jack L. Carlson (Essex Wire Corp.), and secretary-treasurer, Richard Flack (The General Tire & Rubber Co.).

Gifts were distributed to the winners of various events in the golf tournament and to lucky door-prize winners. First prize in golf with a low gross of 73 went to Wayne Place (Jasper Rubber Co.); second place to Francis Frost (Stewart Bolling & Co., Inc.) with 77; and third place to Milton Leonard (Binney & Smith Co.) with 78. Numerous other prizes, all contributed by 91 rubber and supplier companies, were also awarded for various achievements.

Thiokol Club Hears Ball

The rubber reclaiming operations performed by the Midwest Rubber Reclaiming Co. at its East St. Louis, Ill., plant were the subject of an address by John M. Ball at the June 9 dinner-meeting of the Thiokol Technical Club. Held at the offices of Thiokol Chemical Corp. in Trenton, N. J., and attended by several hundred employes and guests of the company, the meeting also included the presentation of a color film, "Behind the Scenes," which illustrated Midwest's operations.

Mr. Ball covered briefly the history of reclaimed rubber and some of the methods used in its recovery from scrap. He also discussed the various forms in which the reclaimed product can be supplied and compared the properties of powdered and of sheet reclaim during the course of the talk. A description of the film was carried in our January, 1954, issue (page 513), when it was first released by Midwest.

Correction on LeBras March 1 Washington Talk

In a recent letter, Jean LeBras, Institut Français du Caoutchouc, Paris, France, asked that certain corrections be made in the report of a talk he gave before the Washington Rubber Group on March 1, which appeared in our April issue on page 74.

Dr. LeBras was credited with saying that natural rubber production in Indo-China was currently 100,000 tons per year; whereas in 1945, production was three times this figure. Production was 74,000 tons in 1953, and the 100,000-ton figure refers to production capacity, which the war in Indo-China makes it impossible to attain. Instead of production being three times as high in 1945, Dr. LeBras said since 1945 a third of the plantations have been made useless by the war.

Our report had it that color limitations caused Indo-China rubber to be sold at prices lower than its application properties would indicate. Dr. LeBras said instead that Indo-China rubber always corresponds to the best commercial qualities, but that if one wanted to prepare the best rubber possible—having in mind the intrinsic properties—one could not always respect certain conditions on appearance (which would involve a lowering of grade according to present sales conditions based solely on appearance). It was added that this fact shows the disadvantage of the present commercial classification and the advantage to consumers to replace it by standards based solely on the technical quality.

RUBBER WORLD is glad to have the opportunity to correct these errors.

Fine Weather at Boston Outing

The eighteenth anniversary outing of the Boston Rubber Group, held at Andover Country Club, Andover, Mass., June 18, was doubly successful this year owing to the beautiful day and to the fact that each one of the 545 members and guests in attendance went away with a prize. Under the direction of its chairman, Arthur I. Ross (American Biltrite Rubber Co.), the outing committee arranged a wide repertoire of games for the amusement of those attending this affair.

Following the sports program, the gathering sat down to a lobster dinner and the awarding of prizes in the various events. The door prize, a set of three matched woods won by Robert MacDonald of Boston Woven Hose & Rubber Co., was also awarded before the singing and other pastimes began.

The golf tournament attracted some 125 persons and saw J. Simpson (Hodgman Rubber Co.) take top honors with a low gross of 67. Other first-place winners in the various golfing events were: low net, R. S. Ellis (Raw Materials Co.); nearest to the pin, Stanley Zulick (Acushnet Process Co.); most sevens, A. L. Lukens (Lukens Laboratories, Inc.); most eights, T. Murphy (Abbe Plastics Corp.); high gross, William Abels (Titanium Pigments Corp.); high net, J. Cancelliere (Premoid Corp.); and putting contest, John Hussey (Goodyear Tire & Rubber Co.)

In the other games, the first-place winners were: darts, Arthur Pierous (Hood Rubber Co.); tub-and-ball game, Anthony Panzeri (Hood); horseshoes, Joseph Cullen (Marbon Corp.); and softball contest, won by Godfrey L. Cabot Co. team, which included non-company members.

TLARGI Holds Father and Son Night

The annual father and son night of The Los Angeles Rubber Group, Inc., sponsored by past chairmen of the Group, was held May 4 at the Hotel Statler, Los Angeles, Calif. Features of the affair were a play, "The Signing of the Constitution"; the induction of D. C. Maddy, of Harwick Standard Chemical Co., into the Grand Lodge of Past Chairmen; and a technical session at which Fred W. Reiter, of Western Pacific Container Division of Stauffer Chemical Co., delivered a paper on "Compounding and Molding of Hard Rubber."

The dinner-meeting was well attended with 341 members and 120 sons of members. The boys were entertained with a movie and refreshments (cokes); while the technical portion of the program was being held, and each was presented with a pair of Swim Goggles by W. J. Voit Rubber Corp. and Rubber Processing, Inc. Following the dinner, the past chairmen took part in the play, ably assisted by members of the drama department of the University of Southern California. Prizes donated by the past chairmen were then distributed to nine of the attending members.

Mr. Reiter, in his talk on hard rubber, recognized that plastics are taking over many of the applications previously reserved to hard rubber. He explained that the reason for this state of affairs was the excessive shrinkage of molded hard rubber unless properly compounded. He discussed some compounding ingredients, such as fillers, plasticizers, and sulfur, and their effects on the finished product. The chemicals used to accelerate curing of the rubber were also covered by the speaker, as were the methods of testing the tensile strength and the hardness of the cured rubber.

Fine Time for New Yorkers

An excellent turnout of some 170 persons had a very fine time at the annual summer outing of the New York Rubber Group on June 10 at Doerr's Grove, Milburn, N. J. Chairmanned by Henry J. Peters, of Bell Telephone Laboratories, the outing presented a diverse program for the entertainment of all those who were present.

The usual variety of food was available during the day, followed by a chicken dinner to complete the festivities. The weather, which had been threatening rain all day, fortunately did not make good the threats.

Old pro Bill Lamela, of Okonite Co., was his usual self with the horseshoes, taking first place in that event, with a second to K. E. Chester, of C. P. Hall Co. Another repeater was M. R. Buffington, Lea Fabrics, Inc., who threw in five out five in the basketball throwing contest. Other events and their winners were: golf drive, Paul Hartsfield, E. I. du Pont de Nemours & Co., Inc.; boccie, first place to R. K. Opper and second place to W. B. Curtis, both of Naugatuck Chemical; baseball throw, Mr. Chester; and darts, first place to Gordon Voigt, of Niagara Rubber Co., second place to W. F. Fischer, of Standard Oil Development Co.

Both baseball games were won by the "Ramblers," who were captained by Ralph Graff, of du Pont; and the "Manhattan" team headed by Andy Rusin, of Raybestos-Manhattan, Inc., pulled in the tug-of-war prize at the close of a very enjoyable day.

Officers Elected; Silastic Discussed at Washington

The May 19 meeting of the Washington Rubber Group, attended by approximately 65 members and guests, and held at the Potomac Electric Power Co. Bldg., Washington, D. C., elected its officers for the coming year and heard a talk on "Recent Developments in Silastic" by George M. Konkle, Dow Corning Co.

The new president is Paul Greer, Office of Synthetic Rubber, Reconstruction Finance Corp. He will be assisted by James Sears, of The Rubber Manufacturers Association, Inc., as vice president; William Dunkle, Goodyear Tire & Rubber Co., as secretary; Ethel Levene, Navy Bureau of Ships, as treasurer; and Rachel Fanning, National Bureau of Standards, American Dental Association, as recording secretary.

The technical portion of the meeting heard Mr. Konkle describe Silastic stocks which have greatly reduced shrinkage and low compression; stocks, available as pastes, which are self-extinguishing; low-consistency pastes for encapsulation of electrical components; stocks capable of being vulcanized in thick sections by use of hot air, but no pressure; and room temperature vulcanizing Silastic pastes.

Symposium on Radioactivity in Rubber and Plastics

A symposium on the applications of radioactivity in the rubber and plastics industries will be held in Boston, Mass., October 6-8, 1954, under the sponsorship of Tracer-lab, Inc., of that city. Its aim is to acquaint the industries with past uses and possible future applications of radioisotopes in research, development, and process control.

The first day will be devoted to orientation talks, with lectures on fundamentals, AEC regulations, health problems, etc. The second and third days will be taken up with technical papers presented by speakers from industry, academic research institutions, and the Atomic Energy Commission.

Melamine Dishware

(Continued from page 519)

oped in cooperation with Monsanto Chemical Co., supplier of the melamine impregnating resin.

Inserted into the mold during the degassing cycle, the impregnated, paper-like disk is cured into the molded dish, becoming an integral part of it. The overlay, printed on the underside, is protected by a hard, glossy melamine surface, and except for the printed design, the disk becomes invisible in the finished product.

The process was originally designed for melamine dishware, but it is adaptable to decorating any compression molded product, according to the company. Although only six prints in lithographic film color separation are currently available for use, a wide variety of designs is possible with the process.

The Einson-Freeman process is a modification of a technique imported from Europe in 1953, when the firm became the exclusive licensee in this country. International Molded Plastics, Inc., Cleveland, O., is presently using it in manufacturing melamine dishes.

the 4 types of furnex®

SRF

give this multi-purpose black wide usefulness

FURNEX

Standard for ideal balance of tensile, modulus and resilience at low volume cost

FURNEX-HB

The soft processing type

FURNEX-NS

The non-staining grade

FURNEX-H

Higher modulus, smoother processing

COLUMBIAN CARBON COMPANY

• A COLUMBIAN COLLOID •

500 TONS OF SMOKE A DAY

COLUMBIAN CARBON CO. MANUFACTURER · **BINNEY & SMITH INC.** DISTRIBUTOR

NEWS of the MONTH

Washington Report and National News Summary

The Agriculture Department cooperative research program on natural rubber with several countries in South and Central America is being continued by the Foreign Operations Administration until July, 1955. Liquidation of this 12-year-old program just short of accomplishment of its objectives appears likely, however, because of governmental red tape.

The Rubber Facilities Disposal Commission has announced the names of the 35 companies which bid for the synthetic rubber plants and has started negotiations with the highest bidder for each facility. The Commission's final report will be filed with Congress next January.

Meanwhile the government's synthetic rubber program has been transferred to a newly created Federal Facilities Corp. in the Treasury Department, as of June 30.

Sales of GR-S and GR-I continue their upward trend due to higher natural rubber prices and anxiety over the military situation in Indo-China.

A recent report of the Bureau of Labor Statistics again emphasizes the shortage of chemists and chemical engineers for the chemical, petroleum, and rubber industries.

Business in industrial rubber products shows signs of improvement, and a higher level of activity during the last half of 1954 is looked for.

Washington Report by Arthur J. Kraft

Only One Year More on Latin Rubber Research Program

The government program aimed at developing a natural rubber producing industry in Latin America[1] is going forward this year on a curtailed basis, and the way things are now pointing, the research portion of the program—its most important part—will be dropped by the wayside next year.

Already the United States Agriculture Department unit of rubber scientists which has been coordinating the research program on behalf of the nine participating Latin American countries is being quietly liquidated, and its personnel transferred to other work.

FOA To Run Program Till July, 1955

For the current fiscal year (which ends next June 30) USDA's Loren Polhemus, who probably knows as much about Latin American natural rubber growing problems as any man on today's scene, has been brought in as a consultant to the Foreign Operations Administration to maintain some semblance of coordination in the research program, during the period of liquidation.

The unit which has been doing this job since the program's inception in 1942 is being disbanded, however. That unit is the Rubber Crops Section of the Field Crops Branch, Crops Research Division, Agricultural Research Service, U. S. Department of Agriculture. The Rubber Crops Section is headed by Marion Parker.

These events have been brought about for no other reason than that, despite universal agreement on the desirability of continuing research on natural rubber in Latin America, no one can seem to agree on which government agency should manage and finance the program. For many months USDA and FOA—with the best will in the world—have been struggling with this problem, but apparently are no nearer a solution today than when they started.

The problem arose some months back when FOA, which has been picking up the $500,000-a-year tab for the rubber research program, served notice that its Congressional charter prohibits use of technical assistance funds for regional research. FOA said it would be happy to continue the so-called "extension" or development side of the program, under which it works on a country-by-country basis assisting in the planting of rubber trees.

Backed by the U. S. rubber manufacturing industry, the Commerce Department, and others, USDA informed FOA that continued research was necessary to assure the success of a planting program, since the major block to growing natural rubber in Latin America has been leaf-blight and other tree diseases and the uneconomic yield issued by those native, wild trees which are resistant to disease. USDA added that the best way to attack this problem is on regional lines, with many countries cooperating in a single program.

For the past dozen years that's how the program has been run, with the U. S. operated testing and evaluation station in Costa Rica forming the hub of the program. The emphasis has been on finding or developing seedlings which are resistant to disease and which can be used commercially without the necessity of costly double-grafting to get a good yield. Thousands of seedlings, sent to Costa Rica by participating countries, have been screened at the lab, and an exchange program also has been established with Malayan and Indonesian rubber scientific institutions, since they, too, are interested in improving the disease resistance of rubber trees.

FOA backed down on its original decision to withdraw funds for operation of the Costa Rican research work. It agreed to provide funds for its continuation through June 30, 1955, if USDA would agree to take over the research program thereafter and seek its own funds from Congress. USDA, while it feels the entire program logically belongs under its management, balked. USDA officials have taken the position that the department cannot do this because of a Presidential directive of June, 1953, giving FOA exclusive jurisdiction over all foreign technical aid projects. USDA, in short, feels it lacks authority to take over the rubber program.

At the moment FOA is taking over all the field personnel of USDA working in the program in Costa Rica and elsewhere (besides two stations in Costa Rica, important research work also is being conducted in Haiti, Guatemala, and Brazil). This personnel will be kept on the job until next June 30, and there's a fair chance that some of them may be continued in this work after next July 1, although it seems doubtful that the coordinated, regional approach will be maintained.

Curtailed Program after 1955?

While FOA ordinarily does not engage in regional research, its officials currently are toying with the idea of continuing the Costa Rica work on a smaller scale as a regional service to its missions in Latin American countries. It is hard to say, under this type of set-up, who will be calling the shots on what work will be done at Costa Rica. It is almost certain that after next June 30, the type of centralized supervision which has been emanating from the USDA Rubber Crops Section people in Washington will have gone by the board. This action is bound to mean some loss of the benefits achieved heretofore by the pooling of results from the field and coordinated direction from the top, despite FOA's desire to avoid losing the years of valuable research to which the now-disbanding USDA Rubber Crops scientists hold the key.

Shafer Urges President Act

Rep. Paul W. Shafer (R., Mich.), who has taken a major interest in rubber security problems as a member of the House Armed Services committee, has attempted to break the legalistic log-jam by a personal appeal to President Eisenhower for presidential intervention in the inter-agency dispute. Mr. Shafer wrote to the President at length about the situation on June 8. His letter was transmitted by the White House to USDA for reply, and the reply was in the process of being drafted as this is written. Here are extracts from the Shafer letter:

"Over the recent past," Mr. Shafer pointed out to the President, "the Foreign Operations Administration has financed all of the U. S. share of the work. It has also carried out the so-called extension phase of the program in participating countries. The Department of Agriculture, with FOA funds, has handled the research work on the regional basis at our main evaluation and screening station at Costa Rica and at other supporting stations.

"In recognition of the security and economic aspects of the problem, FOA has

[1] India Rubber World, Mar., 1954, p. 795; Apr., p. 78; May, p. 241.

recently withdrawn an earlier decision to discontinue its support of the regional work at Costa Rica, which is the very hub and heart of the cooperative program. I understand FOA has agreed, with laudable objectivity, to provide the $144,000 needed to continue the work there for fiscal 1955, on the understanding that the Department of Agriculture would handle the research on a contract basis, and that Agriculture would undertake to budget the work for fiscal 1956.

"I am very much troubled about reports that the Department of Agriculture has determined to withdraw from the program on the basis of the contract offered and thus terminate the work at Costa Rica. Since this decision threatens the life of a program of such great potential importance to our long-range national security [earlier in his letter, Mr. Shafer took note of the military threat to Southeast Asian rubber sources and the probable devastation of rubber trees there should leaf blight ever reach that area—AJK], I would like to hope that Agriculture might re-examine its position with a view to working out with FOA a plan that would make possible the continuation of this vital research. . . .

"The program has the uniform support of the Office of Defense Mobilization on security grounds, the Department of State on political grounds, the Department of Commerce on national economic grounds, and the entire rubber manufacturing industry in the United States.

"In face of these endorsements and present research progress, I cannot understand the decision of the Department of Agriculture to discontinue the regional research in this field.

"From a security standpoint alone, I cannot understand what justification has been offered for this reported decision to disperse the small, but highly skilled team of scientists who pioneered this work; to jettison 12 years of continuous and almost irreplaceable scientific record keeping; and to abandon to the hungry jungles of Central America thousands of carefully selected seedlings which now await final evaluation in our nurseries at Turrialba and Los Diamentes.

"It occurred to me that this matter, involving only a small sum of money, may not have been brought to your attention, and I therefore respectfully urge you to intervene in this inter-department conflict, which may well result in serious retardation of a research program, potentially vital to our security."

Synthetic Plant Bidders All Eligible

The Rubber Producing Facilities Disposal Commission announced on June 11 that all 35 companies (see accompanying tables) which submitted bids to buy government owned synthetic rubber plants and related equipment had met the eligibility tests of the Rubber Disposal Act and may negotiate for the facilities.

"We are pleased that every bidder is eligible to discuss his proposal with us," Chairman Holman D. Pettibone said. "In forthcoming negotiations," he added, "industrial executives will be given ample opportunity to present their position and views on the facilities in which they are interested. However," he cautioned, "it is obvious that with the large number of bidders, considerable time will elapse before all companies can be heard."

The 35 firms had submitted a total of 56 proposals and 19 alternate proposals when bidding closed on May 27. The Commission released the names of the bidders, but withheld further information, such as which company bid for what plant or plants. The Commission informed West Virginia Congressmen, eager to know the prospective fate of the vast Institute copolymer plant, that the number of bids submitted for copolymer plants exceeded the number of plants of that type (there are 13 copolymer plants) available for disposal. The Commission expressed hope that the Institute plant would be sold, leaving what appeared to be the inference that no bid was entered for Institute, but perhaps an unsuccessful bidder for some other copolymer plant might be "backed into" bidding for Institute as negotiations proceed.

As was expected, the bidding interest for the petroleum butadiene plants was somewhat keener (and the bid prices better) than for the copolymer plants. Reportedly, too, the styrene plant drew more bids than any other single facility among the 27 offered.

In its June 11 statement the Commission announced that negotiations would start with the high bidder for each facility. From June 14 on, the Commission's executive director and chief negotiator, Eugene D. Holland, commenced these meetings, seeing one or two companies a day. These initial sessions were not expected to reach the contract signing stage, but were devoted to clarifying specific points made in the purchase proposals. Mr. Holland appeared pleased with the serious intent of the bidders and the cooperative attitude they evinced in replying to his questions. The Commission apparently had decided to withhold information on the prices offered for the plants as well as the number of proposals submitted for the various categories of plants (copolymer, butadiene, Butyl, etc.). Thus far, at least, the Congressmen from constituencies in which synthetic rubber plants are located have taken no exception to this secrecy policy and the turning aside of queries for specific details.

All of this information, however, will be made public when the Commission files its final report with Congress in January. Under the disposal law, Congress will have 60 days in which to consider the proposed contracts, ample time for Congress and other interested parties to express their views on the purchase proposals and the disposition of the plants suggested by the Commission.

RFC Rubber Program to Treasury

President Eisenhower last month issued an executive order transferring operation of the government's synthetic rubber program from the Reconstruction Finance Corp. to a newly created Federal Facilities Corp. in the Treasury Department. The transfer became effective June 30, the date set for expiration of RFC under legislation enacted last autumn.

Laurence B. Robbins, RFC Administrator at the time of its demise, was slated to move over to the Treasury Department to

ALPHABETICAL LISTING OF BIDDERS FOR THE GOVERNMENT OWNED SYNTHETIC RUBBER FACILITIES

American Chemical Corp.
Richfield Oil Corp.
Stauffer Chemical Co.
American Synthetic Rubber Corp.
American Biltrite Rubber Co.
American Cyanamid Co.
Anaconda Wire & Cable Co.
Brown Rubber Co., Inc.
Dewey & Almy Chemical Co.
Dunlop Tire & Rubber Co.
Endicott-Johnson Corp.
Faultless Rubber Co.
Hewitt-Robins, Inc.
General Cable Co.
Goodall Rubber Co.
Johnson Rubber Co.
KYS Corp.:
Bata Shoe Co., Inc.
Bristol Mfg. Co.
Converse Rubber Co.
Goodyear Footwear Corp.
Goodyear Rubber Co.
LaCrosse Rubber Mills Co.
Servus Rubber Co.
Tingley Reliance Rubber Co.
Tyer Rubber Co.
Phelps Dodge Copper Products Corp.
Raybestos-Manhattan, Inc.
Rome Cable Corp.
Seamless Rubber Co.
Simplex Wire & Cable Co.
Sponge Rubber Products Co.
Thermoid Co.
Wooster Rubber Co.
Climax Molybdenum Co.
Copolymer Corp.
Armstrong Rubber Co.
Armstrong Rubber Mfg. Co.
Dayton Rubber Co.
Gates Rubber Co.
Mansfield Tire & Rubber Corp.
Sears, Roebuck & Co.
Seiberling Rubber Co.
Dow Chemical Co.
Esso Standard Oil Co.
Firestone Tire & Rubber Co.
Food Machinery & Chemical Corp.
Foster Grant Co., Inc.
General Chemical Division, Allied Chemical & Dye Corp.
General Tire & Rubber Co.
Goodrich-Gulf Chemicals, Inc.
B. F. Goodrich Co.
Gulf Oil Corp.
Goodyear Synthetic Rubber Corp.
Goodyear Tire & Rubber Co.
W. R. Grace & Co.
Great Southern Chemical Corp.
Chicago Corp.
Gulf Oil Co.
La Gloria Corp.
Pontiac Refining Co.
Hercules Powder Co., Inc.
Heyden Chemical Corp.
Humble Oil & Refining Co.
Koppers Co., Inc.
Merck & Co., Inc.
Midland Rubber Corp.
Minnesota Mining & Mfg. Co.
Monsanto Chemical Co.
Montrose Chemical Co.
J. G. Mulligan & Co.
National Lead Co.
Edwin W. Pauley
Petroleum Chemicals, Inc.
Cities Service Co.
Continental Oil Co.
Phillips Chemical Co.
Phillips Petroleum Co.
Publicker Industries, Inc.
Shell Chemical Corp.
Shell Oil Co.
Sinclair Refining Co.
Standard Oil Co. of California
Texas Co.
United States Rubber Co.

SYNTHETIC RUBBER FACILITIES OFFERED FOR SALE BY THE RUBBER PRODUCING FACILITIES DISPOSAL COMMISSION

Present Operator	Location
Synthetic Rubber (GR-S) Plants	
Copolymer Corp.	Baton Rouge, La.
Firestone Tire & Rubber Co.	Akron, O.
Firestone Tire & Rubber Co.	Lake Charles, La.
General Tire & Rubber Co.	Baytown, Tex.
B. F. Goodrich Chemical Co.	Port Neches, Tex.
B. F. Goodrich Chemical Co.	Institute, W. Va.*
Goodyear Synthetic Rubber Corp.	Akron, O.
Goodyear Synthetic Rubber Corp.	Houston, Tex.
Kentucky Synthetic Rubber Corp.	Louisville, Ky.
Midland Rubber Corp.	Los Angeles, Calif.
Phillips Chemical Co.	Borger, Tex.
United States Rubber Co.	Naugatuck, Conn.
United States Rubber Co.	Port Neches, Tex.
Butyl Rubber (GR-I) Plants	
Humble Oil & Refining Co.	Baytown, Tex.
Esso Standard Oil Co.	Baton Rouge, La.
Butadiene Plants—Petroleum	
Cities Service Refining Corp.	Lake Charles, La.
Copolymer Corp.	Baton Rouge, La.
Humble Oil & Refining Co.	Baytown, Tex.
Neches Butane Products Co.	Port Neches, Tex.
Phillips Chemical Co.	Borger, Tex.
Sinclair Rubber, Inc.	Houston, Tex.
Shell Chemical Corp.	Los Angeles, Calif.
Standard Oil Co. of California	El Segundo, Calif.
Butadiene Plants—Alcohol	
Carbide & Carbon Chemicals Co.	Louisville, Ky.*
Koppers Co., Inc.	Kobuta, Pa.*
Styrene Plant	
Dow Chemical Co.	Los Angeles, Calif.
Other Facilities	
United States Rubber Co.	Naugatuck, Conn.

* In stand-by.

head up the new corporation as an assistant to Secretary George Humphrey. No change in operating personnel or policy for the rubber program was involved in its transfer to the new agency.

Mr. Robbins is expected to become a full-fledged Assistant Secretary of the Treasury, when and if Congress approves a bill, requested by Mr. Humphrey, creating an additional assistant secretaryship. Besides managing the rubber program under Treasury, Mr. Robbins will continue to supervise operations of the government owned tin smelter at Texas City, Tex., and liquidation of remaining RFC business and defense loans.

The executive order had no effect on management of the rubber plant disposal program. That remains in charge of the Rubber Producing Facilities Disposal Commission, created as an independent agency by the Disposal Law enacted last summer. The three-member commission had been independent of RFC and will remain independent of Treasury.

Rising Trend of GR-S Sales Continues

The recent upward push in synthetic rubber sales is still continuing, according to the last estimates of RFC, which reported that sales of GR-S are expected to rise 10% from August to September—from 44,000 to 48,000 long tons.

Sales in July are expected to run at 38,000 tons, a 2,000-ton increase from the forecast made by RFC in mid-May, and 4,000 tons higher than the original 34,000-ton forecast for July, which was issued by RFC in mid-April. All in all, this is a marked improvement in the sales picture over that of the late winter and early spring months. Accounting for the better GR-S sales are slightly higher prices for natural rubber, bringing them to a par with the price of GR-S, and anxiety over the military situation in Indo-China.

RFC had been paring production of GR-S to the bone in an effort to halt further accumulation of inventory. Government held stocks, as a result, were trimmed from 89,300 tons on March 31 to 80,600 tons two months later, safely within the 85,000-ton ceiling which RFC must observe at the close of the fiscal year, June 30.

With its once top-heavy GR-S inventory under control, RFC has decided to ease somewhat the firm lid it held on production. The agency boosted its July production schedule to 35,800 tons, a rise of 800 tons from the mid-May estimate of July output. The August schedule calls for a further increase to 39,000 tons, or 3,200 tons higher than envisioned in mid-May. The September production schedule calls for 39,300 tons.

The June production schedule called for production of 35,580 tons of GR-S (the figure, as with the others cited above, includes rubber hydrocarbon plus oil extenders). This is a modest increase of about 300 tons over previous plans for June output. The June schedule includes 25,825 tons of LTP (cold rubber), 3,550 tons of black masterbatch, 12,800 tons of oil masterbatch, 2,680 tons of oil-black masterbatch, and 3,580 tons of GR-S latex. The carbon black contained in masterbatch types is included in these tonnage figures.

Final figures on actual sales of GR-S in May showed a total sale of 38,229 tons (net plus oil), including 26,704 tons of LTP. Sales of black masterbatch totaled 5,268 tons; oil masterbatch totaled 11,060; oil-black masterbatch totaled 2,247 tons; and latex, 3,729 tons. Sales of GR-I (Butyl) amounted to 6,097 tons, but production was trimmed to 3,400 tons in June owing to a two-week curtailment at the Baytown, Tex., plant for "turn-around."

Tire Companies Protest S. 175 Bill

Three tire manufacturing companies have filed statements with the Senate Judiciary Committee in opposition to S. 175, a bill which would require that new, rebuilt, retreaded and recapped tires and tubes be sold to consumers (other than the government) only by independent tire dealers.

The protesting companies were Goodrich, Goodyear, and Firestone. The proposal is being considered by the committee following a one-day hearing in May by a special subcommittee which took testimony from its sponsor and nearly lone advocate, National Federation of Independent Business. The bill, in one form or another, has been kicking around the Capitol for the past 12 years. It is aimed at eliminating oil companies, manufacturer-owned stores, and chain outlets from the tire selling field, leaving it open exclusively to independent tire dealers.

The three major tire makers pointed out in their letters to the committee that company-owned stores handle no more than 10% of the retail tire business and pose no threat to independent dealers. Firestone stated that it accords equal treatment to company stores and independent dealers handling the Firestone brand.

The National Association of Independent Tire Dealers filed a statement contending that company stores and gasoline service station chains "are responsible for many of the most serious evils in the industry," and are able to undersell independent dealers. "The independent tire dealers are today operating under serious handicaps which, if not eradicated, may well gradually eliminate them from their rightful places in the industry," the NAITD said. It charged that "factory controlled recappers with only 5% of the shops were doing 20% of the business in 1953, including a substantial amount of government recap business and at prices which their own dealers cannot meet."

NAITD, however, did not specifically endorse S. 175.

BLS Says Technical Help Still Scarce

Most large companies in the rubber, chemical, and petroleum industries were having difficulty in recruiting chemists and chemical engineers in the last half of 1953, according to a pilot-study of "Demand for Personnel in the Chemical Professions" conducted by the Bureau of Labor Statistics and the Department of Defense.

Highlights of the study's findings, re-

leased by Labor Secretary James P. Mitchell in June, follow:

One out of every 12 employes in the surveyed chemical firms was an engineer or scientist. The ratio for the petroleum companies was one out of every 15 and for the rubber firms it was one out of 40.

Scientific employment rose sharply in recent years in the chemical and petroleum industries, considerably less in the rubber industry. Between 1948 and 1953 the chemical firms surveyed increased their employment of chemists by 28%, chemical engineers by 45%, and of other scientists and engineers by 62%. For petroleum companies, the corresponding increases were 26, 40, and 44%, respectively; for rubber companies, six, 26, and 46%.

"Increases in employment of chemists and chemical engineers would probably have exceeded those actually achieved in recent years," the study concluded, "if the supply of personnel had been more adequate. In over half the reporting companies, going or proposed activities were hampered or curtailed between 1948 and 1953 by manpower shortages in the chemical professions. Research and development was the major activity most affected by these shortages; companies had to give production departments priority in recruitment and sometimes had to shift personnel from research to production work, at the expense of promising research projects."

In the chemical companies an average increase of 7% in employment of chemists and 12% in employment of chemical engineers was planned for 1953. These projected increases were greater than the actual employment gains in 1952 and several previous years. In rubber companies also, the estimated 1953 need of personnel exceeded recent employment increases, but petroleum companies were planning to expand their staffs in the chemical professions by a smaller percentage than in immediately preceding years.

In the last half of 1953, all petroleum firms surveyed and more than half of the chemical and rubber companies indicated they had vacant positions for chemists which they were having difficulty in filling. All petroleum firms and nearly half of the chemical and rubber companies also had hard-to-fill vacancies for chemical engineers. A third of the surveyed firms in all three industries combined reported greater difficulty in recruiting needed chemists and chemical engineers in 1953 than in 1952.

Field BDSA Assistant Administrator

John A. Field, of Port Washington, N. Y., who has served as a consultant to the Chemical and Rubber Division of the Business and Defense Services Administration since May, was named an Assistant Administrator of BDSA last month.

On leave from Carbide & Carbon Chemicals Corp., Mr. Field, in his new post, will supervise the Chemical and Rubber Division and several other BDSA industry divisions. He has extensive government experience, including service with synthetic rubber plants operated by Carbide during World War II. In 1945 he served as manager of the Butadiene-from-Alcohol Section of Rubber Reserve and in 1946 was promoted to manager of the Production Control Section of Rubber Reserve.

Rubber-lined equipment for the chemical industry is in fair demand, and several big ore mining jobs scheduled for 1954 and 1955 are expected to result in large orders for conveyor belts.

Some confirmation for the above predictions is found in the June, 1954, issue of "Industry Survey" of the U. S. Department of Commerce, where rubber goods manufacturers sales for March were recorded at $388 million in contrast to January and February sales reported at $348 and $351 million, respectively.

URWA Wage Talks On

Wage talks between the United Rubber Workers Union, CIO, and the major rubber companies, first reported in our May issue (page 246), are now under way.

Talks between URWA and Goodyear began in Canton, O., May 4. They were recessed toward the end of May, to begin again in Cincinnati, O., June 22.

Firestone and URWA started wage talks in Cleveland, O., on June 16. U. S. Rubber commenced to negotiate with URWA on June 22, in New York, N. Y., while Goodrich began its talks with the union in Cincinnati on the same day.

About 110,000 workers in the Big Four rubber companies are affected by the wage contract negotiations now going on. URWA had indicated that it hopes to obtain a substantial general wage increase, a guaranteed annual wage program, and "correction of inter and intra plant wage inequities" for its members.

National News

Outlook for Lignin Products

Last month we reported on three papers presented before the meeting of the Chemical Market Research Association held at the Hotel Statler in New York on May 20, in which the outlook for the rubber, plastics, and petrochemical industries was reviewed.[2]

A fourth paper given at the meeting on the outlook for lignin and lignin derivatives by Paul R. Wiley, West Virginia Pulp & Paper Co., has now become available.

Mr. Wiley said that of the applications developed for whole lignin the most promising for its tonnage potential is the reinforcement of rubber, where it serves as a reinforcing agent analogous to carbon black and mineral pigments.[3] He emphasized further that lignin should not be regarded as a replacement for other pigments, but as an additional pigment which permits attaining a new combination of properties.

West Virginia Pulp & Paper has just put into operation a small plant to produce lignin-rubber masterbatches, in order to make available the commercial quantities needed for extended large-scale evaluations.

Other uses for whole lignin mentioned were as an extender for rubber latex adhesives and for the stabilization of asphalt emulsions.

Chemical derivatives of lignin include sulfonates for use in dispersants and as a source of vanillin and those obtained by breakdown of lignin by oxidation, hydrogenation, destructive distillation, and other reactions.

It was concluded that although the possibilities for chemicals from lignin are still in the realm of conjecture, if such processes turn out to be practicable and yield useful chemicals, there will be no shortage of lignin raw material for some time to come.

[2] Rubber World, June, 1954, p. 381.
[3] India Rubber World, May, 1951, p. 178.

Rubber Business Better?

Business in industrial rubber products is showing some signs of an upturn, according to an article datelined Akron, June 16, in the New York *Journal of Commerce*. Sales managers of leading rubber companies say that usually a drop in orders for belting and other industrial rubber products is followed in 60 days by a decline in general industrial activity. Similarly when a better tone develops in new orders, this means that production of many kinds of goods is on the upgrade.

Improvement is reported in that bookings for industrial rubber products for the last 60 days (April 15 through June 15), after leveling off, have followed the normal seasonal pattern. June is expected to show a slight seasonal dip. Prior to May, the decline was substantially more than seasonal.

The sales managers say that July, too, may show a dip, because of plant closings for summer vacations of workers, but in August signs of improvement should really begin to appear.

One sales manager suggested that inventory reductions are just about finished. Demand for rubber products in the farm equipment field is said to be better. In the auto industry the intense competition between General Motors and Ford is keeping the demand for rubber products active.

Drogin Reports on South America

The impressions of I. Drogin, research director of United Carbon Co., Inc., Charleston, W. Va., who with his wife recently returned from a 13,000-mile trip to South America, have been reported in *United's Carbon Black News*. Many of Dr. Drogin's comments are recorded below because of their probable interest to the rubber industry in general.

Calling upon the principal carbon black consumers in each of the seven countries visited (Venezuela, Colombia, Peru, Chile, Argentina, Uruguay, and Brazil), Dr. Drogin was impressed by the rapidly growing rubber industry of that continent. Three new tire plants are now in operation (Firestone in Venezuela, Dunlop and General in Brazil), and six more are expected to be operating within a year.

High mileage is not the primary concern of such manufacturers, however, especially in the tropical countries where strong tires are required because of the poor roads in the interior. Excesses of speed, heat, and over-inflation are other important considerations of the manufacturer, he reports. To cope with these conditions which result in ply separation, radial or groove cracking, gouging, bruising, cutting, chipping, and concussion ruptures, tires are being constructed with many extra plies.

Development work is generally planned far in advance, he states, with the added requirement that large inventories be on hand.

Use of the newer-type carbon blacks lags behind this country and Europe; channel blacks are only now being replaced by high abrasion furnace blacks, and trial studies are being made on super abrasion furnace blacks.

Synthetic rubbers are receiving greater consideration than in the past, he concluded, although their use in some countries is prohibited.

Other Industry News

U. S. Rubber Agrees to Latex and Thread Consent Decree

United States Rubber Co., Rockefeller Center, New York 20, N. Y., recently agreed to settle a five-year-old anti-trust suit involving its international latex and foreign elastic thread businesses by taking part in a consent decree. Thus were ended negotiations which followed a civil suit brought by the government in December, 1948, claiming violation of the anti-trust laws by U. S. Rubber and Dunlop Rubber Co., Ltd., of England.

The company joined in the consent decree because, according to a statement, it will be less costly to revise its methods of conducting foreign elastic thread business to satisfy the government than to contest the case in a court trial. U. S. Rubber, however, still believes that it has not violated the anti-trust laws in this case. As for the representations concerning its latex business, it contends that the cross-licensing of patents was cancelled years before the suit was started, and that, in any case, such licensing never interfered with the flow of commerce in latex rubber.

Claiming that many of the complaints brought by the government have no substance, the company listed two areas of activity about which the remaining complaints center. These are: the joint ownership and operation by U. S. Rubber and Dunlop of a number of foreign elastic thread companies; and the partnership of the two firms in a foreign latex products pool (under the name of International Latex Processes, Ltd.) which sells patent rights for royalties.

The consent decree requires that each of the elastic thread companies be separately managed, while permitting continued joint ownership of such companies. Regarding the latex patent pool, continued operation is permitted with the stipulations that the defendants agree to grant licenses in foreign countries without restrictions to all applicants (this practice, the rubber company claims, has been the one generally followed in the past), and that U. S. Rubber agrees not to use foreign or domestic latex patents to impede export of products from or import into the United States.

Koroseal as Fire Barrier in Roofs

Fire-retardant Koroseal material, manufactured by The B. F. Goodrich Co., Akron, O., is currently being used in roof construction to prevent the drippage of inflammable asphalt and tar into a manufacturing plant. Recent automotive plant fires have reportedly led experts to believe that roof construction of the plants produced conditions which accelerated the growth and added to the seriousness of these fires.

As a result, the construction of the new Ford Motor Co. engine plant No. 2 in Brookpark, O., is using the Koroseal material. It is expected that by placing the 0.004-inch thick flexible material within the 500,000 square feet of roofing (between the steel decking and Fiberglas insulation), a "vapor barrier" will be formed which will eliminate the hazardous factors present in conventional roofs.

This type of roof structure, using the black, opaque Koroseal lining, is reported to cost no more to install than regular roofs.

Lightweight, 100% Nylon "Aldairized" Woman's Raincoat by Cable Raincoat Co. *(Left)* and Similar Man's Raincoat by the Same Company *(Right)*

"Aldair" Breathable Waterproof Fabric Shown

Waterproof fabric that "breathes" is made possible by a new rubber coating process, called "Aldair," which Aldan Rubber Co., Philadelphia, Pa., introduced by way of a demonstration for the press at the Statler Hotel, New York, N. Y., June 24. The process, for which Aldan Rubber is presently the exclusive licensee, was developed and patented by the Goodyear Tire & Rubber Co. to meet the unusual climatic conditions encountered during the Korean conflict.

Albert Dannenbaum, president of Aldan Rubber, said that manufacturers of raincoats, children's snowsuits, sleeping bags, footwear, sports jackets, and hospital sheeting have already expressed interest in "Aldair." Several garments, including the man and woman's raincoats illustrated were demonstrated.

Joseph E. Mayl, vice president, and James E. Bruskin, manager of Vinylfilm sales, both of Goodyear, were present and explained the development of the process for manufacture of the microporous coated fabric and its use in the "Mark IV" suit for airmen for protection in the event they were forced to "bail out" and struggle for their lives in the icy waters off Korea. Similar garments made from conventional rubber or vinyl coated fabrics were almost unbearable because of the perspiration vapor which condensed within them and seriously affected the flyers' efficiency.

The process by which "Aldair" is made possible is patented under U.S. patent No. 2,626,941.

Donald O. Agnew has been appointed field manager-special accounts for the associated tires and accessories division of The B. F. Goodrich Co. Tire & Equipment Division, Akron, O.

Testing Program for Reinforced Plastics Manufacturers

Under a United States Navy Department Bureau of Ordnance contract, Foster D. Snell, Inc., 29 W. 15th St., New York 11, N. Y., is engaged in studying all thermosetting reinforced plastic materials available for ammunition cases and similar uses. It is expected that this survey and test program will result in the development of a general-performance specification for reinforced plastic ammunition cases and in the compilation of a list of manufacturers whose materials meet the minimum requirements of the performance specification.

To this end, the Snell organization is soliciting manufacturers to submit their products for test free of charge. Such samples will be subjected to investigations to determine their moisture vapor transmission, shock and impact resistance, tensile and compression strengths, and ability to withstand internal air pressure.

Conveyor Belt Press Named for Foster

One of the world's largest conveyor belt presses, capable of vulcanizing belts up to 72 inches wide, was recently named the Judge Foster Press in honor of Homer D. "Judge" Foster, manager of the industrial products division of Goodyear Tire & Rubber Co., Akron, O. A plaque commemorating the naming of the press was unveiled by E. J. Thomas, president of Goodyear. The plaque paid tribute to Mr. Foster's "forty years of loyal service and outstanding achievements with Goodyear."

Foxboro Builds Pittsburgh Factory

A 15,000-square foot plant, scheduled for completion August 1, is being erected in Pittsburgh, Pa., by The Foxboro Co., Foxboro, Mass. Constructed of steel and brick on two levels, the structure will house general offices and sales headquarters on the lower level and facilities for assembling, servicing, and stocking instruments and control valves on the upper, 12,000-square foot floor.

Timken Builds Atom-Proof Vault

A vault that will be capable of protecting valuable microfilm records in the event of an atomic bomb attack outside of a half mile radius of its location is being constructed by The Timken Roller Bearing Co. at its new Philadelphia, Pa., plant. Among the documents to be stored in the vault are some 375,000 engineering drawings, a precaution which will help to insure a continued supply of the company's products in case of an atomic war.

Sixteen feet high and 27 feet square, the vault will have its base 11 feet underground. Reinforced concrete will be used to construct walls 15 inches thick and the ceiling, 18 inches thick. A heat pump system will control the temperature and humidity at all times.

Goodrich Giant Equipment Tire; Safety Achievements

Construction equipment tires measuring 6½ feet in diameter and weighing 1,200 pounds are being produced by The B. F. Goodrich Co., Akron, O., for use on modern earth-moving machines. This is the largest-size tire (24.00 by 29) that the company has ever made, and its use will permit the handling of loads as high as 23 tons by off-the-road construction equipment, according to Goodrich.

In the manufacture of less formidable tires, the company claims to have achieved a first with the announcement that its tire and tube manufacturing plant at Oaks, Pa., has worked 5,000,000 man-hours without a disabling injury. This is said to be the highest number of injury-free man-hours ever worked in a company plant, and the firm is proud of this historic safety achievement.

Safety promotion in another form has also paid dividends for the company, as witnessed by the recent presentation of The Alfred P. Sloan Award to Goodrich, "For consistent contribution to traffic accident prevention through numerous messages and safety hints on a commercially sponsored network of stations."

The Sloan Award, broadcasting's top honor for public service in highway safety promotion, recognized the more than 7,900 separate station spot messages on traffic safety sponsored by Goodrich during 1953.

Monsanto Plasticizer Bulk Station

The sixth plasticizer bulk station, intended to provide faster deliveries and greater selection of the materials, has been established at Greensboro, N. C., by Monsanto Chemical Co., St. Louis, Mo. This particular installation is located for the convenience of customers in the rapidly growing southeastern part of the United States.

Adds to Flooring Line

Several new flooring styles in both vinyl and rubber lines have been introduced by The Goodyear Tire & Rubber Co., Akron, O. Among the additions are four new colors in the Heavy Duty Homogeneous vinyl line (available in 3/32- and ⅛-inch gages in tile or roll), four new colors in the residential vinyl line (0.080-inch thick), and four new styles in the residential rubber flooring series.

Flo-Mix Consumption Up

The present and anticipated demands for Flo-Mix, a powdered reclaim material manufactured by U. S. Rubber Reclaiming Co., Inc., Buffalo, N. Y., has required the company to use a substantial part of the facilities of its new plant and to draw up plans for increased production from other units. The product, introduced to the industry one year ago,[1] sells for about 10% less than comparable grades of slab reclaim. The easy flowing properties of Flo-Mix have found a market for the material in certain phases of tire manufacture and in many applications now under experimentation.

[1] See our Sept., 1953, issue, p. 812.

Speedwalk Begins Operation in Jersey City

The world's first passenger conveyor belt was placed in operation on May 24 by the Hudson & Manhattan Railroad at its Erie Station stop in Jersey City, N. J. Called the Speedwalk, the "moving sidewalk" was installed to help homeward bound Jersey commuters negotiate the 1,000-foot tunnel between the Tube exit and the Erie Railroad Station.

The first 137 feet of this distance rises 10%, a grade which has earned for that stretch the name "cardiac alley." The Speedwalk eliminates this climb and continues on the horizontal a distance of 90 feet, terminating after a total of 227 feet before the toll booths of the H & M Tubes. It is reported that the remaining distance of some 800 feet to Erie Station will be similarly equipped if this unit proves successful.

Operating at a speed of 120 feet a minute over approximately 1,000 steel rollers, the 5⅛-inch thick belt can accommodate 10,800 passengers an hour. At this rate, which is slightly less than the maximum safe speed of 1½ mph. and one half the average walking rate on a horizontal surface, the walking passenger can traverse the distance in 35 seconds as compared to a time of 55 seconds required at a normal up-grade gait.

The Speedwalk is 5½ feet wide (one-half the width of the tunnel) and is operated in only the upward direction at present, although reverse operation is possible. A 20-hp. motor drives the endless belt and the moving hand rails. Cost of the unit, which was designed by Goodyear Tire & Rubber Co. and Stephens-Adamson Mfg. Co., was $75,000, and installation was completed in less than one month. The rubber and fabric belt, weighing 11,000 pounds, was manufactured by Goodyear; the machinery was supplied by Stephens-Adamson.

The idea of the Speedwalk originated with the proposed Times Square Central Shuttle system for New York, N. Y., also designed by these companies. It is reported that construction of the Shuttle will begin this fall.

Another Speedwalk Working

Following on the heels of the recent opening of a commercial Speedwalk for carrying commuters over a 227-foot distance, Goodyear Tire & Rubber Co. has installed an outdoor Speedwalk to study the power requirements and effects of all types of weather on an unprotected unit. The experimental model, located at the Akron, O., plant of Goodyear Aircraft Corp., measures 70 feet long by 42 inches wide and carries approximately 10,000 employes over a 10% incline each day.

Constructed with four plies, the belt uses a 15-hp. motor to handle the load. As many as 7,200 persons can be accommodated on the unit, according to the company.

Cyanamid Opens Accelerator Plant

A rubber chemical accelerator plant which more than doubles present production capacity was opened recently by American Cyanamid Co. at its Bound Brook, N. J., installation. The new plant is devoted exclusively to the production of NOBS Special and NOBS No. 1 accelerators, both of which are intended for use in reinforcing high pH furnace blacks in natural and GR-S rubbers.

U. S. Rubber Builds New Warehouse

A modern three-story warehouse and office building measuring 425 feet long by 200 feet wide and containing some 281,000 square feet of area will be erected by United States Rubber Co. on a site near to the company's large footwear plant in Naugatuck, Conn., at a reported cost of $1,765,592.

Purpose of the new building is to permit storage centralization of the finished footwear and other products manufactured nearby. The company expects to provide better service to customers throughout the country since all of the products will be under one roof. An electronic system for overnight transmittal of orders direct to Naugatuck from any sales branch, plus modern handling systems serviced by conveyors will facilitate shipment of orders within a short time.

Construction of the new building, expected to be finished by the spring of 1955, will be of reinforced concrete slab with aluminum sash, and foundations which will permit the addition of a fourth floor are included in the plans. The warehouse will contain, in addition to the storage and office facilities, a hospital, cafeteria, and basement garage.

Contracts for Linde Air Silicone Plant

A contract for the initial construction work on its proposed silicone producing plant at Long Reach, W. Va., has been awarded to Baker & Coombs, Inc., by Linde Air Products Co., a division of Union Carbide & Carbon Corp., New York, N. Y. Work was scheduled to begin in June.

Linde has been producing silanes and silicones for several years at a pilot plant in Tonawanda, N. Y., and products made from these materials are now being introduced to the industry. Such products included water repellents, electrically insulating varnishes and resins, mold release agents, silicone rubber gum stock, etc.

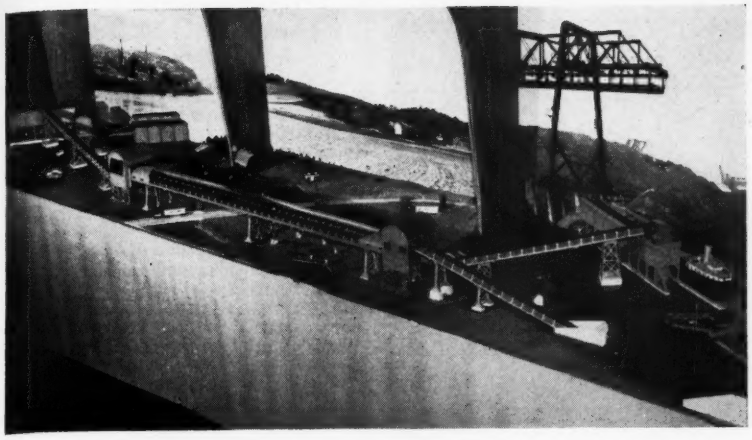
More Flexol Plasticizer TOF

Increased quantities of Flexol Plasticizer TOF, known chemically as tri-(2-ethylhexyl) phosphate, are now available from a recently completed production unit at the South Charleston, W. Va., plant of Carbide & Carbon Chemicals Co. The plasticizer has been used successfully in many vinyl and rubber products.

"Voice of Firestone" on ABC

The Firestone Tire & Rubber Co., Akron, O., has completed arrangements with the American Broadcasting Company to broadcast the "Voice of Firestone" on its television and radio networks from 8:30-9:00 on Monday evenings. Thus the presentation of the musical program continues without interruption except for the identity of the network over which the program was broadcast. The change was necessitated because the National Broadcasting Co., which formerly carried the show, was unable to continue televising the evening program.[1]

[1] See our June, 1954, issue, p. 389.



Goodyear's Working Model of the Proposed Riverlake Belt Conveyor System

H-R in Passenger Conveyor Belt Field

Development work on a passenger conveyor belt that would be suitable for use in the Buffalo station of the New York Central Railroad is being conducted by Hewitt-Robins, Inc., Stamford, Conn. Major advantage of the company in this field is that it can manufacture both the belting and the machinery necessary for operation.

Similar to other units of this type, the conveyor will consist of a rubber belt about six feet wide which will ride on flat rollers. Speed will be 1½ miles an hour, which is about half the average walking speed.

The company claims that the unit can be adapted for carrying crated and boxed goods normally handled by truck and railroad. It was pointed out that successively larger jobs are being planned for conveyor belts, as for example, the 103-mile Riverlake conveyor to be constructed between Cleveland, O., and a point on the Ohio River near Pittsburgh, Pa. This belt, designed by the Riverlake Engineering Council, of which Hewitt-Robins is a member, will carry iron ore from Cleveland to the steel mill area and bring back coal on the return trip.

As shown in the accompanying illustration, the unit is divided into three sections showing the lake-front and river terminals and the central section as the belt crosses open country. Two scale transfer points for routing the coal and ore on and off the main line belts are also contained in this working model.

Rhodia Engineering Service

An engineering service section which makes available to industry trained specialists in the handling of air and stream odor pollution problems has been established in the industrial Alamask reodorant division of Rhodia, Inc., 230 Park Ave., New York, N. Y. The division recently acquired from E. I. du Pont de Nemours & Co., Inc., produces odor abatement and reodorant products.

Chief of the new section is H. C. Nichols, formerly with Merck & Co. Sales management will be handled by Edward A. Bush, who had previously been with Dow Chemical Co. Other personnel in the section include Stanley A. Dunn, research associate; David Bowlus, field technical sales representative; Stephen Novak, office manager; and Louis Appell, laboratory director.

Model of Riverlake Conveyor

The Riverlake Belt Conveyor Line (see above) is also a concern of Goodyear Tire & Rubber Co., as witnessed by that company's construction of a miniature working model of the conveyor system. Purpose of the model is to publicize the system by showings throughout the State of Ohio, in a specially built trailer with a glass side.

Legislation on the belt project had been "indefinitely postponed" in 1951 when bills were presented to both the Ohio Senate and House. These bills attempted to give belt conveyor lines the same rights as those enjoyed by public utilities. Another attempt to obtain legislative approval of the project, this time to provide such belt transportation with the status of a common carrier, is expected to be introduced into the Ohio Legislature in 1955. It is probably with an eye toward this move that the rubber company is attempting to publicize the project.

The belt model, containing 6,776 working parts, will move miniature coal in one direction and make-believe iron ore in the other.

Synthetic Silicates from Diatomite

A plant for the manufacture of synthetic silicates from diatomite, the fossilized remains of tiny marine plants called diatoms, is being constructed at Lompoc, Calif., by Johns-Manville Corp., 22 E. 40th St., New York 16, N. Y. From the silicates the company expects to produce a new line of products for use as absorbents, bulking agents, or extenders in the paint, rubber, and other industries.

Located adjacent to the present J-M facility which recovers diatomite from a company deposit claimed to be the largest and purest known, the new plant will process the crude material by reaction with lime or magnesia under pressure to obtain the synthetic silicates, according to a company announcement.

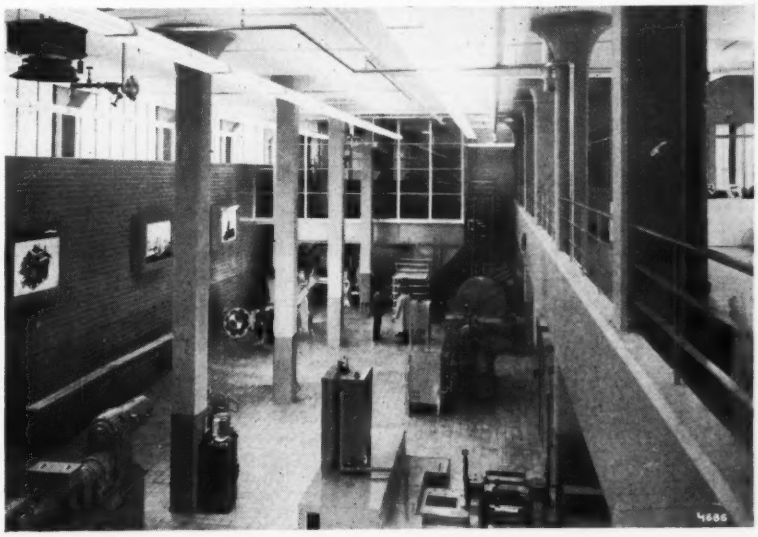
Tire Marketing Agreement

A marketing arrangement whereby the U. S. Royal and Fisk lines of passenger-car and truck tires of the United States Rubber Co. will be sold through California Oil Co. of Perth Amboy, N. J., has been concluded. In addition to the tires, batteries and other automotive accessories will be made available by the oil company to distributors handling its gasoline and oil products from Virginia to all six New England states.

F-B Process Lab Begins Operation

The recently completed process laboratory of Farrel-Birmingham Co., Inc., Ansonia, Conn., has been put into operation. The unit replaces a similar lab formerly maintained at the firm's Derby plant where experimental and process testing work was carried on by manufacturers of rubber and plastics.

The new lab is three times larger than the old Derby installation and contains new and improved machines. Its purpose is to serve manufacturers who wish to experiment on new processing techniques and the development of new products.



General View of New Farrel-Birmingham Process Lab

Silicone-Coated Orlon Cloth for Airplane Flaps

A new silicone rubber coating, compounded from General Electric's SE-76 silicone gum, has been developed by Irvington Varnish & Insulator Division of Minnesota Mining & Mfg Co. for application to orlon cloth. The cloth is being fabricated into an aileron flap seal for the Boeing B-47 Stratojet bomber.

The coating was selected because of its unusual resistance to temperature extremes and because it possesses notable adhesion to cloth. The silicone gum also permits the flap seal to withstand ozone and corona at high temperatures. Result is a cloth, known as "Irv-O-lon," which will last from 3-10 times longer than the material it replaces, according to the manufacturer.

G-E Film on Productive Maintenance

A full-color motion picture on "Productive Maintenance" showing industry how to get the most productivity out of existing facilities has been announced by General Electric Co., Schenectady, N. Y. Dramatizing the concept and five-step plan of such maintenance, the 25-minute film is currently being shown throughout the nation in conjunction with a series of Productive Maintenance Forums under the sponsorship of the apparatus sales division of the company. Following the 26 planned forums, the movie will be available for showings at trade and association meetings.

G-E is also making available an 18-page illustrated bulletin (GEA-6087) entitled, "Five Steps to Productive Maintenance," which covers essentially the same material as the film.

Cyanamid Dedicates Chemical Plant

The newly constructed Fortier, La., plant of American Cyanamid Co., Rockefeller Center, New York 20, N. Y., was officially opened last month. It marks the entrance of Cyanamid into the field of producing industrial chemicals from natural gas.

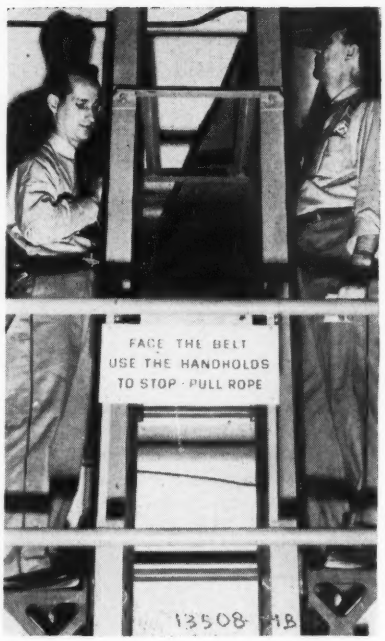
Already in operation are facilities for the production of sulfuric acid, oxygen, and ammonium sulfate. Units for the manufacture of acetylene, hydrocyanic acid, ammonia, and acrylonitrile are expected to go on stream shortly.

Tyer Capitalization Changed

Stockholders of Tyer Rubber Co., Andover, Mass., at their annual meeting, May 17, voted to eliminate the 50,000 shares of authorized common stock without par value, comprising part of the capitalization of the company, and to substitute therefor 150,000 shares of common with a par value of $10 a share.

Each stockholder is now the owner of three shares of the new $10 par value common for each share of common without par value that was registered in his name on the books of the company on May 17, 1954.

Stockholders are to retain their old certificates. The company will issue two additional shares of the new stock for each share of the old.



Attendants Using "Man-Lift" in Manhattan Garage

Vertical Passenger Conveyor Belts

A continuous rubber conveyor-belt elevator containing small standing platforms (or steps) and handles to be grasped by passengers has been installed in the new parking garage of the Airlines Bldg., New York, N. Y. Purpose of the 105-foot vertical unit, named the "Man-Lift," is to carry parking attendants to and from the four levels of the garage, with a minimum of time and effort.

On the elevator, the rider can travel from floor to floor at a rate of 75 feet a minute. The steps are spaced at intervals of approximately 16 feet, with handles 4½ feet above the step. Capacity of the belt is eight persons a minute in both directions.

Designed by J. B. Ehrsam & Sons Mfg. Co., the "Man-Lift" uses a five-ply, 14-inch wide rubber and cotton belt made by The Goodyear Tire & Rubber Co., Akron, O. A three-hp. motor, which can be stopped or started by anyone on or off the lift by pulling a parallel rope, moves the conveyor belt around two 20-inch pulleys when the "Man-Lift" is functioning.

Timken Expands Bucyrus Plant

An expansion program that will cost $3½ million by the time it is completed in early December is now under way at the Bucyrus plant of The Timken Roller Bearing Co., Canton, O.

Included among the equipment to be installed are six new furnaces, costing a total of $360,000, and 16 automatic screw machines. The furnaces, with auxiliary equipment, will carburize, harden, and temper bearing parts at a capacity rate of 4,300 pieces an hour; such parts will be fed to the furnaces from five bearing cone production lines. The new screw units, now on order, will also be a part of the cone production line.

Miniature Shoe Samples for Wellco Salesmen

Exact miniature samples of all the shoe styles manufactured by Wellco Shoe Corp., Waynesville, N. C., are being supplied to all affiliated factories of the company and to some of its sales personnel who find it too cumbersome to carry the entire range of full-size samples. The miniatures weigh only 1½ ounces, as compared to seven ounces for the regular samples.

Another innovation of the company, which several years ago replaced actual samples with flat, full-size fabric cutout illustrations, is the manufacture of 3-D full-color 35 mm. transparencies of new samples. These transparencies are mailed out soon after the first sample has been completed to save time in acquainting customers with new styles.

Constructs Warehouse-Office Building

The B. F. Goodrich Co. Tire & Equipment Division has completed a one-story brick and steel district office and warehouse building in Oklahoma City, Okla. Occupancy is scheduled for October of this year.

Although erected to Goodrich designs and specifications, the structure is not owned by the rubber company, but by a Texas firm. Goodrich has leased the building for ten years for use as a tire distribution center. Some 17,000 square feet of the contained area will be used for warehousing truck and car tires, with the remaining 3,000 square feet devoted to office space.

Indianapolis Winner Again Uses Firestone Tires

This year's Memorial Day 500-mile race at Indianapolis, Ind., the safest and fastest in the history of the event, again saw the winner cross the finish line on Firestone tires. Bill Vukovich finished first in a field of 33 cars, with an average speed of 130.840 miles an hour, thus repeating his performance in the 1953 classic.

Mr. Vukovich credited much of his victory to the lightweight, cool-running nylon cord tires, a new model of Firestone's racing tire line. The event marked the thirty-first consecutive time that the company's tires have been used on the winning car.

Shell Acquires Lac Chemicals

A transaction under which Shell Chemical Corp., 50 W. 50th St., New York 20, N. Y., has acquired the major physical assets of Lac Chemicals, Inc., alcohol producer in Culver City, Calif., has been announced. The sale includes real estate, inventories, bonded warehouse facilities, and the alcohol denaturing plant which Lac has been operating for the past 18 years.

By providing local facilities for compounding denatured alcohol and proprietary solvents, Shell expects to improve its service to West Coast customers. All the product grades offered and the level of service previously rendered by the Lac organization will be continued, according to the company. This acquisition brings to four the number of denaturing plants operated by Shell in this country.

Quaker Obtains Pioneer Rubber Mills

H. K. Porter Co., Inc., parent concern of Quaker Rubber Corp., Philadelphia, Pa., has purchased Pioneer Rubber Mills Inc., Pittsburg, Calif., and will incorporate the new acquisition into the Quaker organization as a new division.

Pioneer will retain its identity, according to the purchaser, and will continue to manufacture rubber belting, hose, packing, and other industrial rubber products similar to those produced by Quaker. Its acquisition now provides the Quaker firm with factories on both coasts.

Sumner M. Suhr, sales manager who has been with Pioneer since 1917, has been appointed manager of the new division under George A. Dauphinais, vice president and general manager of Quaker.

Rubber Roll Covering Plant Being Constructed

A new plant designed solely for the processing of the highly specialized rubber roll coverings used in modern papermaking and textile finishing is under construction in Griffin, Ga., for Stowe-Woodward, Inc., Newton Upper Falls, Mass. Feature of the modern structure will be its functional efficiency, according to the company.

Operation of this facility, expected to be completed in December, and the opening of another branch plant in Neenah, Wis., which was scheduled for last month, will bring to three the number of such installations. Both new operations duplicate the manufacturing techniques employed at the company's home plant.

Three Miles of Geon Piping in Operation

More than three miles of rigid vinyl pipe, made of Geon resin by Southwestern Plastic Pipe Co., Mineral Wells, Tex., has been successfully operating in Kansas oil fields since late last year. In the pipe's assigned capacity of carrying salt water separated from crude oil to deep disposal wells, the chemical inertness of the vinyl plastic has justified its use.

Furthermore, the elimination of the required perfectly graded ditches and the light weight of the pipe have permitted a labor saving of two-thirds the cost of comparable steel piping.

Approximately 12,300 feet of three-inch and 4,000 feet of four-inch pipe in 30-foot sections are included in the installation. Joining of the sections, which are belled at one end, is accomplished by means of a special cement painted on the male portion of the joint before insertion.

Kel-F Prices Reduced 22-42%

The fourth major price reduction since their commercial introduction in 1948 was announced for Kel-F fluorocarbon compounds by The M. W. Kellogg Co., Jersey City, N. J. Ranging from 22-42%, with the greatest drop for high-density plastic molding powder in small lots, the decreased prices were represented as being the result of increased acceptance, expanded production facilities, and certain economies effected in the manufacture of the compounds.

William C. Enright

Enright Appointed ARco Sales Manager

William C. Enright has been named sales manager of the Automotive Rubber Co., Inc., Detroit, Mich., a company engaged in rubber products manufacture, materials compounding, fabrication, and lining service work.

Mr. Enright joined the firm in 1939 at its inception. He previously had been employed for 10 years as a metallurgical engineer with Chrysler Corp. and next, for three years, as district sales engineer for Western Felt Works. With ARco, he served for six years as a sales engineer, following which he was appointed head of ARco Equipment, with responsibilities for all of the company's activities in the fabrication and rubber insulation of processing tanks, pressure vessels, etc. His new position entails responsibility for the sale of all of the firm's products.

One such product, an Acid Buggy designed to handle corrosive chemicals, was recently introduced by ARco. Available in the 400-gallon capacity model XB-425 and in other sizes, the Buggy is built for 150 psi. service. It is equipped with Saunders-type rubber-lined valves, 6.00 by 16 tires, four 50-foot lengths of acid hose with various accessories, and 75 feet of ½-inch diameter hose. The tank, weighing 1,500 pounds and rubber lined inside and out, is mounted on a 1,300-pound frame assembly with the accessories to complete the unit.

Neoprene-Covered Fan Belts

Fan belts with oil, heat, and ozone-resistant neoprene synthetic rubber covers will soon be available for automobile engines at no extra cost, according to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., producer of the rubber. Vehicles such as trucks and buses, where heavy-duty service is encountered, have been using similar belts, it is reported, but until now such units have not been available for passenger cars.

The belts will be distributed by several large petroleum companies through their service stations, it is stated. Such belts are constructed with rayon cord, precision molded to eliminate ragged edges and prestretched to assure proper tension. The covers are fabricated of double-thick, neoprene-impregnated fabric.

European $CaCO_3$ Firm Opens New York Office

The Swiss firm of Pluess-Staufer, manufacturer of calcium carbonates under the trade mark, OMYA, has opened in New York, N. Y., a subsidiary organization known as Pluess-Staufer (North American) Inc. One of the carbonates to be marketed by the firm is a new natural surface-treated calcium carbonate known as OMYA BSH.

This material is described as having a cryptocrystalline structure due to the particular formation of the deposits from which it is taken. It is also claimed to be easily dispersed in coating agents, and, while not intended for use as a reinforcing filler, it does aid the incorporation of such substances into compounds, according to the company.

Quartermaster Organizations Combine

The New York Quartermaster Purchasing Agency has been integrated into the Philadelphia Quartermaster Depot as the purchasing division of the Depot. Completion date for the transfer is scheduled for early July.

The bidders commodity mailing lists maintained by NYQMPA will be consolidated with those of the Depot, and future purchases will be made by the newly formed division. The mailing lists of the NYQMPA involved include the names of manufacturers and other suppliers of textiles, clothing, footwear, equipage, and miscellaneous general supplies, including chemicals.

Union Rubber Partnership Dissolved

The partnership of Vern C. Ratliff and William L. Richards which owned the Union Rubber Co., Los Angeles, Calif., has been dissolved, with Mr. Ratliff now in complete control of the Los Angeles plant of the company, and Mr. Richards in complete control of the Oakland, Calif., plant. Mr. Ratliff's organization will be known as the Ratliff Rubber Co. while Mr. Richards' facilities will retain the name of Union Rubber Co.

The dissolution of the partnership has been friendly, and there have been no major changes in personnel or business policy of either installation.

Witco Carbon Black Plant Opens

A new carbon black plant in Ponca City, Okla., with an annual capacity of 40 million pounds, was officially opened last May by R. I. Wishnick, president of Continental Blacks, Inc. Production from the new installation, which is staffed by 45 persons, will be distributed exclusively through Witco Chemical Co., 260 Madison Ave., New York 16, N. Y., a part owner of Continental.

At the opening ceremonies Mr. Wishnick declared that the use of carbon black as a reinforcing agent in tires has made possible the guaranteeing of long life and, in many instances, 100,000 miles of service. The material is now considered of strategic importance, being consumed to the extent of 1.5 billion pounds a year.

U. S. Foam Rubber Plant Opens

Production of U. S. Koylon foam products began recently at United States Rubber Co.'s new foam rubber plant in Santa Ana, Calif. These products include furniture and automobile cushions and rug underlay, the company states, although other items may be produced there in the future.

On a 54-acre tract of land, the installation is a modern one-story structure containing 87,000 square feet of floor space. It employs some 150 persons and is operated by the footwear and general products division of the company.

Counseling Service

A new counseling service in public relations, advertising, and sales promotion has been formed by R. T. Hollister, former promotion manager and public service editor of the *Akron Beacon Journal* and more recently public relations manager of Dayton Rubber Co. Known as Robert T. Hollister & Co. and located in Akron, O., the service is already representing various industrial accounts as well as financial institutions and trade organizations, according to an announcement.

OBITUARY

C. Dudley Armstrong

C. Dudley Armstrong, a director and former vice president and secretary of Armstrong Cork Co., Lancaster, Pa., died on June 8 in Haverford, Pa. He had been ill for some months.

Born in Wilkinsburg, Pa., in 1888, Mr. Armstrong was the grandson of the founder and first president, and the son of the second president of the cork company.

The deceased joined the company in 1910, and after seeing service in World War I, returned to the firm to become first vice president in 1920. He was general manager of the subsidiary cork and insulation company and later head of foreign operations, a position he continued to hold after his election to secretary of the firm in 1937. He retired from these posts last September, but remained on the board of directors until his death.

Mr. Armstrong is survived by his wife, a sister, five children, and six grandchildren.

Funeral services were held June 10 at St. James Episcopal Church in Lancaster.

Edward E. Lutwack

Edward E. Lutwack, 54, manager of trade relations for Goodyear Tire & Rubber Co., died in Akron, O., on May 30 after a short illness.

Mr. Lutwack, a graduate of the Military Academy at West Point, had been with Goodyear since 1927, beginning as a service representative and rising to his last-held post in 1952.

During World War II, however, the deceased was a lieutenant colonel in the U. S. Army Air Forces from 1942 to 1945.

He leaves his wife, a son, and a daughter.

CALENDAR

July	23.	Chicago Rubber Group. Annual Golf Outing. St. Andrews Country Club, West Chicago, Ill.
Aug.	3.	New York Rubber Group. Golf Tournament. Baltusrol Golf Club, Springfield, N. J.
Aug.	20.	Philadelphia Rubber Group. Annual Outing. Cedarbrook Country Club, Mount Airy, Philadelphia 19, Pa.
Sept.	9.	Miami Valley Section, SPE. Annual Fall Outing. N.C.R. Old River Park, Dayton, O.
Sept.	11-13.	Division of Rubber Chemistry, A. C. S. Hotel Commodore, New York, N. Y.
Sept.	15.	New York Section, SPE. Hotel Gotham, New York, N. Y.
Sept.	20-22.	ASTM Committee D-20, Plastics. Hotel Carter, Cleveland, O.
Sept.	23.	Southern Ohio Rubber Group. Fall Technical Meeting.
Sept.	25.	Connecticut Rubber Group. Annual Outing.
Sept.	30.	Fort Wayne Rubber & Plastics Group. Van Orman Hotel, Fort Wayne, Ind.
Oct.	5.	The Los Angeles Rubber Group, Inc. Hotel Statler, Los Angeles, Calif. Buffalo Rubber Group. Westbrook Hotel, Buffalo, N. Y.
Oct.	6-8.	Symposium on Applications of Radioactivity in the Rubber and Plastics Industries. Tracerlab, Inc., Boston, Mass.
Oct.	7.	Miami Valley Section, SPE.
Oct.	8.	Detroit Rubber & Plastics Group, Inc. Detroit Leland Hotel, Detroit, Mich.
Oct.	13.	Newark Section, SPE. Military Park Hotel, Newark, N. J.
Oct.	14.	Northern California Rubber Group.
Oct.	15.	Boston Rubber Group.
Oct.	20.	New York Section, SPE. Hotel Gotham, New York, N. Y. Washington Rubber Group.
Oct.	22.	New York Rubber Group. Henry Hudson Hotel, New York, N. Y.
Nov.	3.	The Los Angeles Rubber Group, Inc. Hotel Statler, Los Angeles, Calif.
Nov.	10.	New York Section and Newark Section, SPE. Joint Meeting. Hotel Gotham, New York, N. Y.
Nov.	11.	Northern California Rubber Group. Miami Valley Section, SPE.
Nov.	17.	Washington Rubber Group.
Nov.	18.	Rhode Island Rubber Club. Metacomet Golf Club, East Providence, R. I.
Dec.	4.	Miami Valley Section, SPE. Christmas Party. Hartwell Country Club.
Dec.	8.	Buffalo Rubber Group. Christmas Party. Buffalo Trap & Field Club, Williamsville, N. Y.
Dec.	9.	Northern California Rubber Group.
Dec.	10.	Detroit Rubber & Plastics Group, Inc. Christmas Party. Sheraton Cadillac Hotel, Detroit, Mich. New York Rubber Group. Christmas Party. Henry Hudson Hotel, New York, N. Y. Boston Rubber Group. Christmas Party.
Dec.	18.	Southern Ohio Rubber Group. Christmas Party.

Jerome T. Shaw

Jerome T. Shaw, publisher and editor of *Tires-TBA Merchandising*, died suddenly at his home in Hastings-on-Hudson, N. Y., on May 26. He was in his sixty-sixth year.

Mr. Shaw was editor of *Tires* since its founding in 1919, prior to which he had been an editor on automotive business publications and an automotive editor on daily newspapers. As a young man, he covered the Glidden Tours and the Vanderbilt Cup Races for the *New York Times* and has since written feature articles for that newspaper on various phases of the tire business.

At the time of his demise, Mr. Shaw was president of the Greater New York Tire & Battery Association. He has held many important posts in various trade organizations in the past.

He leaves his wife, a son, and two daughters.

Godfrey H. C. Gundry

Godfrey H. C. Gundry, chairman of Morris Ashby, Ltd., London, England, died on June 2 after an illness which had prevented his active participation in the firm for the past two years. He was 74 years old.

Mr. Gundry had been actively engaged in the company for more than 50 years. He succeeded his father as managing director in 1917 and became chairman in 1930. He was also chairman of Binney & Smith & Ashby, Ltd., and of Amalgamated Oxides, Ltd. (1939), since their inception and was a director of The Deanshanger Oxide Works, Ltd.; these three concerns are all associated with Morris Ashby, Ltd. The deceased, furthermore, was a member of the London Metal Exchange since 1915.

During the last war when the British Government assumed responsibility for the purchase of many vital war materials, Mr. Gundry became chairman of the trade associations concerned with the distribution of carbon black and North American natural asphaltum.

Kenneth F. Cooper

Kenneth F. Cooper, retired senior vice president of American Cyanamid Co., New York, N. Y., died suddenly on May 23 at his farm in Pine Plains, N. Y.

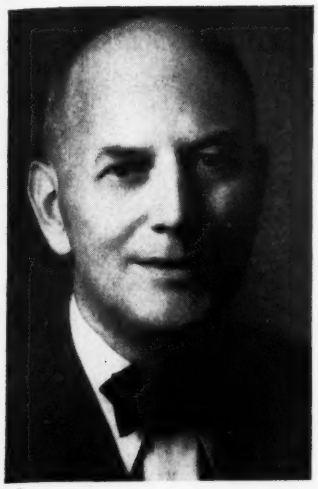
He was born in Corvallis, Oreg., on July 5, 1879. Mr. Cooper was graduated from Leland Stanford University with a degree in civil engineering. He worked for four years on the Pacific Coast before joining the Muscle Shoals Electric Power Co.

He came to American Cyanamid in 1907 with its founding and helped to design and construct the company's first plant at Niagara Falls, following which he became works manager of that installation. After three years he was made general manager of the company and held this post until 1916, when he was elected to the board of directors and became vice president. Both these latter posts were held until his retirement in 1947.

Funeral services were held on May 26 in New York. Internment was at All Saints Church Cemetery, Great Neck, Long Island.

Mr. Cooper is survived by his wife and two daughters.

NEWS ABOUT PEOPLE



Seward G. Byam

H. Logan Lawrence

Seward G. Byam, for the past 11 years sales manager for neoprene, has been named to the newly created post of sales manager in charge of technical publications for the rubber chemicals division of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. **H. Logan Lawrence,** former district sales supervisor in the New England area and assistant neoprene sales manager since early last year, succeeds Mr. Byam.

Formed to correlate the division's growing output of technical literature, Mr. Byam's new position will involve responsibility for expediting publication of data on rubber chemicals and on elastomer research.

Mr. Byam, experienced in the rubber field and allied industries for 38 years, joined du Pont in 1919 as chief chemist of the Fairfield, Conn., plant. From 1922-1925, he was associated with Plymouth Rubber Co., then returned to du Pont. He has held various responsibilities with the firm, among them assistant manager and later associate director of the rubber laboratory and finally neoprene sales manager (in 1943). Mr. Byam served as chairman of the Division of Rubber Chemistry, A. C. S., from 1952-53.

Mr. Lawrence, who joined the du Pont firm in 1934, held the positions of assistant sales manager of the export sales section and sales supervisor in New England before his recent promotion to neoprene sales manager.

The marketing department, Shell Chemical Corp., 50 W. 50th St., New York 20, N. Y., recently reorganized to unify related product groups, is now staffed with the following personnel:

G. W. Huldrum, Jr., formerly eastern division sales manager, is now general sales manager, supervising management of sales groups and chemical products managers.

J. M. Selden, formerly eastern division manager, is now assistant to the vice president of the marketing department.

W. E. Keegan, formerly assistant to the eastern division sales manager, is now sales manager with primary responsibility for the marketing districts.

A. Jonnard is manager of the newly formed trade analysis department under Mr. Keegan.

G. R. Monkhouse continues as senior corporation representative on the West Coast as vice president in charge of the ammonia division. The company's eastern and western divisions as such are dissolved, however, and their district offices will report to the single sales management group in New York, responsible for solvents, industrial chemicals, resins, and plastics.

K. R. Fitzsimmons, formerly eastern division resins and plastics supervisor, is now industrial chemicals manager.

J. J. O'Connell, Newark district manager, is now solvents manager.

A. V. Snider and **F. S. Swackhamer** will continue as managers of the export and resins and plastics departments, respectively.

M. L. Griffin, formerly marketing operations manager, is now manager of the administrative office.

F. W. Hannsgen, of the head office staff in New York, is now Newark district manager, succeeding Mr. O'Connell.

Minnesota Mining & Mfg. Co., St. Paul, Minn., has announced the election to its international division of **E. Harlan Church** as treasurer and **Eugene F. Kindler** as assistant treasurer. Mr. Church, also assistant treasurer of the parent organization, has been with 3M since 1941, when the firm acquired Inland Rubber Corp. Mr. Kindler joined 3M in 1936 and held the position of chief cost accountant until his promotion.

Edward R. Newcomb, in another announcement from the company, was elected vice president of export sales for the division. Mr. Newcomb started with 3M in 1950 as a special sales representative to the railroad industry, prior to which time he had been sales manager of Durex Abrasives Co. He became export sales manager of the 3M international division in 1953.

Peter G. Sloan has been named Ohio sales representative for Goshen Rubber Co., Inc., Goshen, Inc. Mr. Sloan has had wide experience in the field of manufactured rubber parts for industrial use, a field in which the company is interested.

Donald B. Benedict has been appointed works manager of Carbide & Carbon Chemicals Co. Joining the company in 1933, Mr. Benedict progressed through various positions at the South Charleston, W. Va., plant, becoming superintendent of chemicals and resins in 1940 and general superintendent of the plant in 1952. His most recent post, that of assistant works manager, was achieved in 1953.

Norman J. Elder was elected vice president and manager of the calender division, and **H. P. Lamb** was made vice president and manager of project engineering of Adamson United Co., Akron, O. Mr. Elder joined Adamson in 1946, after having been associated with The B. F. Goodrich Co. and the Morse Instrument Co.; with Adamson, he has held the posts of manager of production and sales of calenders and calender accessories, and of Rotocure machines. Mr. Lamb came to Adamson as an automatic control specialist in 1939, after four years with the Ohio Rubber Co., and held the position of manager of project engineering since 1946.

Norman J. Elder

H. P. Lamb

W. H. T. Furry has been named director of the training and education division of Foxboro Co., Foxboro, Mass., succeeding **Malcolm B. Hall,** who recently completed 40 years of service with the firm. Widely experienced in the field of instrument education, Mr. Furry has taught courses for Pennsylvania State College. Prior to joining Foxboro in 1952, he was instrument training coordinator at the Atlantic Refining Co. Mr. Hall, who has been director of training since 1942, continues at the division in an advisory capacity and as a lecturer on automatic control.

Roger W. Gunder has been promoted to western sales manager of Stauffer Chemical Co., San Francisco, Calif. Mr. Gunder, who has served the company for 20 years, was formerly manager of the Los Angeles sales district.

George W. Thurman has been named technical sales representative in the Chicago area by Union Bay State Chemical Co., Inc., Cambridge, Mass.

Edward Lebo, public relations director of Hewitt-Robins, Inc., Stamford, Conn., has been given the added responsibility of advertising manager. Mr. Lebo joined the company two years ago after wide experience as a newspaperman and industrial publicist in New York.

Stanley W. MacKenzie, director of purchases, United States Rubber Co., and **Edward M. Krech,** director of purchases, J. M. Huber Corp., were elected president and vice president, respectively, of the Purchasing Agents Association of New York.

M. Bill Plumlee has been named personnel manager of the Cadillac, Mich., plant of The B. F. Goodrich Co., Industrial Products Division. Mr. Plumlee joined the company in 1951 as personnel assistant at the Miami, Okla., tire and tube manufacturing plant, a position he held until his present assignment.

M. C. Throdahl, section manager of rubber chemicals development, has been named assistant director of the development department of Monsanto Chemical Co.'s organic chemicals division. Mr. Throdahl, who joined the firm in 1941, will be headquartered in St. Louis, Mo., and will temporarily continue his previous responsibilities.

Philip Wong has been appointed manager of new products development for The Bearfoot Sole Co., Inc., Wadsworth, O. He will assist the company in its recent venture in diversification through the formation of the Bearfoot Airway Corp. Mr. Wong was with Firestone Tire & Rubber Co. before joining Bearfoot in 1945.

Allan Clinch has been appointed sales representative in Ohio for the Rubber Corp. of America. Associated with the firm since 1950, he has performed development work on plastisols and technical assistance to customers. Mr. Clinch will be responsible for the sale within that state of the company's plasticizers, latex compounds, plastisols, and latices.

Diamond Alkali Co., 300 Union Commerce Bldg., Cleveland 14, O., has announced the promotion of the following five men within its organization:

William H. Evans, manager of the firm's silicate operations, which cover six plants, and former treasurer of the company, has been elected vice president.

John W. Mantz, assistant general manager of the Painesville, O., plant, becomes general manager of the newly created silicate, detergent, calcium division. He joined the company in 1946 and served from 1948-1950 as industrial relations manager at Painesville before becoming assistant general manager.

L. T. Welshans, for the past seven years technical director of the Painesville technical staff, is now general manager of the newly formed cement and coke division.

C. R. Brown, manager of industrial relations at the same installation since 1950, moves up as assistant works manager, succeeding Mr. Mantz. Mr. Brown, in turn, is succeeded by **Robert McConnell,** formerly his assistant.

J. M. Huber Corp., 100 Park Ave., New York 17, N. Y., has announced the promotion of the following three men: **Gerald W. Harris,** in charge of eastern sales to the rubber industry, has been named assistant vice president to supervise sales of carbon blacks, clays, and rubber chemicals; **Paul W. Libby,** supervisor of rubber sales in the Midwest and Far West, has been made manager of the company's development laboratories at Borger, Tex., in charge of technical service to western customers; and **Louis F. Gongwer,** supervisor of development laboratories at Borger, has been appointed divisional manager of sales to the rubber and general industries.

Richard B. Young was elected treasurer, and **Karl P. Goodwin** was elected to the board of directors of Acushnet Process Co., New Bedford, Mass. Both men became associated with the firm in 1938, Mr. Young as a trainee, and Mr. Goodwin in the engineering department. Mr. Young later became, successively, assistant factory manager, factory manager, and salesman before this election to the post formerly held by his father, Phillip E. Young, who continues as president and chief executive of the company. Mr. Goodwin served as assistant to the factory manager and then as director of sales before becoming vice president in 1953.

Kenneth M. Kashdan has been appointed special service representative to the handbag, luggage, and related leather goods industries for Rubber & Asbestos Corp., Bloomfield, N. J. The wide acceptance given to the company's new "overnight tack" plastic handbag cement has dictated the appointment of a full-time representative, according to R & A. Mr. Kashdan has specialized in leather and fabric bonding problems for the past 15 years, during which time he has represented several of the country's leading adhesive manufacturers.

L. M. Johnson recently became vice president in charge of sales and a director of Geauga Industries, Middlefield, O. A former general manager of Johnson Rubber Co., Mr. Johnson previously had been employed by Chardon Rubber Co. and had been a partner in the Johnson Sperry Rubber & Plastics Co., all of Middlefield.

Robert C. Woodley, eastern regional GTAC sales manager, has been promoted to manager of dealer relations of The General Tire & Rubber Co., Akron, O. Mr. Woodley joined General in 1938 as a territory sales manager in the eastern division, and, after having served as assistant western zone sales manager for a tobacco concern from 1942-48, he joined General in 1949 in charge of eastern division car-dealer sales.

James R. Tully, merchandising manager of the Fisk-Gillette division of United States Rubber Co., Rockefeller Center, New York 20, N. Y., has been appointed market manager of petroleum, tires, batteries, and accessories sales for the company's tires division. With U. S. Rubber since 1933, Mr. Tully will coordinate TBA sales to various petroleum marketers. **William F. Beardsley,** district manager at Los Angeles, Calif., of the Fisk-Gillette division, replaces Mr. Tully as merchandising manager of that division.

E. J. Dunlavy, Jr., former vinyl film sales representative for the Goodyear Tire & Rubber Co. in New York, has been assigned to the company's vinyl film sales staff in Akron, O. He is replaced by **R. W. Malarney,** a newcomer to the Goodyear sales organization, who covered the New York and New England area while associated with several other firms in the plastics field.

John S. De Noia has been appointed assistant industrial sales manager of Permacel Tape Corp., New Brunswick, N. J., a company which manufactures industrial tapes for application in such fields as aviation, automotive, packaging, electrical, electronic, and tape-printing. Mr. De Noia, in the sales organization of the company since 1940, had also been associated with Raybestos Manhattan, Inc., and with McKay Co.

Royce J. Noble, consulting engineer, has been elected vice president of Rubatex Products, Inc., 420 Lexington Ave., New York 17, N. Y., to head the company's research and development program. Dr. Noble, who will also serve as a director, has been a consultant in the rubber and latex fields since 1931, having been chief of the engineering division of the Army Ordnance Corps' Edgewood Arsenal and an adviser to the Bureau of Ships on synthetic rubber products.

Roy Wallace has been named manager and **John H. Drexler** has been appointed special sales representative of the central sales district of the Goodyear Tire & Rubber Co.'s chemical division. Mr. Wallace joined the company in 1948 and was special sales representative before taking over his new duties. Mr. Drexler, who will specialize in Pliovic resins, joined the company this year.

James A. Pollock has been named factory manager of the new Ashtabula, O., chemical plant of The General Tire & Rubber Co. A member of the General organization since 1943, prior to which he has been employed for seven years by United Engineers & Constructors, Inc., Mr. Pollock has served the rubber company at the government synthetic rubber plant at Baytown, Tex., and later at General's Akron, O., headquarters.

Pach Bros., N. Y.

Chester J. Noonan

Herbert J. Reid

Chester J. Noonan, vice president of United States Rubber Co., Rockefeller Center, New York 20, N. Y., has been appointed to the newly created position of executive general manager of two operating divisions of the company, the footwear and general products division and the mechanical goods division. Mr. Noonan has been vice president and general manager of the former division since 1953. He started with U. S. Rubber in 1919, rising through the managerships of various sales groups and becoming general sales manager of the division in 1943 and assistant general manager in 1950.

Other appointments within the mechanical goods division of U. S. Rubber are the promotions of **Matthew J. Delehaunty,** former manager of industrial sales, to manager of commodity sales; and of **H. Leon Moran,** formerly manager of the division's Fort Wayne, Ind., plant, to the newly created post of new products manager.

Mr. Delehaunty, who replaces the late Harry M. Frecker, will combine the functions of his past position with those of his new one. He has been with the company since 1922 and has held the responsibilities of Pittsburgh branch manager before having been appointed manager of industrial sales last year.

Mr. Moran will be responsible in his new post for speeding the adoption and commercialization of new products. He began in the rubber industry in 1922 and has held the positions of superintendent of a major division of the company and of general superintendent.

Herbert J. Reid has been appointed factory manager of the Fort Wayne plant of the mechanical goods division, succeeding Mr. Moran. Mr. Reid, formerly assistant factory manager, began with the company in 1931 and has held the posts of technical superintendent and general superintendent of the Gilmer plant in Philadelphia and assistant to the production manager at Fort Wayne.

The appointment of two executive vice presidents and of three vice presidents has been announced by Carbide & Carbon Chemicals Co., 30 E. 42nd St., New York 17, N. Y., as follows:

Robert N. Graham, with the company since 1922 in such capacities as plant superintendent (1935), assistant works manager (1940), and vice president for operations (1944), has been named executive vice president in charge of production.

William F. Reich, Jr., who started with Linde Air Products Co. in 1919 and rose to the positions of general sales manager for Carbide & Carbon Chemicals (1932) and vice president (1944), has been appointed executive vice president in charge of sales.

N. C. Babcock, manager of the industrial chemicals division since 1944, has been made vice president.

E. E. Fogle, sales manager of the industrial chemicals division since 1953, has been elected vice president.

H. D. Kinsey, formerly plant manager at the atomic energy facility in Oak Ridge, Tenn., and presently works manager (since 1946), has been named vice president.

Baird Rubber & Trading Co., Inc., New York 7, N. Y., has announced the retirement of **Denis P. Mochary,** vice president and director, after 20 years of association with the firm, and the appointment of **Richard Higgins,** formerly with Charles T. Wilson Co., as assistant traffic manager. Mr. Mochary's duties in the sales field will be assumed by **Paul A. Mulach, Collier W. Baird, Jr.,** and **Robert B. Baird,** the last a vice president of the company.

W. H. Pender has been named manager of belting sales for Quaker Rubber Corp., Philadelphia, Pa. A veteran of some 20 years in the rubber industry and a Quaker employe since 1947, Mr. Pender had been field engineer for conveyor and elevator belting until this promotion.

Victor E. Vallet, president of Giffels & Vallet, Inc., L. Rossetti, associated engineers and architects of Detroit, Mich., received the honorary degree of Doctor of Engineering from the University of Colorado at the commencement ceremony in June. Mr. Vallet was graduated from that University in 1916 with a Bachelor of Science degree in civil engineering and obtained experience in the engineering fields for the next nine years until forming, with R. F. Giffels in 1925 and with Mr. Rossetti some time later, his own company. The firm is reported to design about $410 million of construction annually.

Lynn Frost, advertising manager of Hewitt-Robins, Inc., Stamford, Conn., has been promoted to the newly created position of merchandising and sales promotion manager of the company's Restfoam division. Mr. Frost joined the firm as assistant advertising manager in 1949 and became manager last year. In his new post he will handle the merchandising and promotion of foam rubber products, rubber and plastic flooring, sponge rubber rug underlay, and Foam-Tuft rugs.

J. P. Seiberling, president and chairman of the board of the Seiberling Rubber Co., Akron, O., was recently invested with the honorary degree of Doctor of Laws from the University of Akron in recognition of his "industrial and civic leadership."

Kenneth H. Irons has been appointed technical sales representative in the Akron, O., office of Harwick Standard Chemical Co. Mr. Irons, a chemist, started his career in the rubber industry with Koppers Co., later moving on to the Gates Rubber Co., and finally to the Ohio Rubber Co. before his recent appointment with Harwick Standard.

Kenneth H. Irons

"Storer of Spellman"

Victor E. Vallet

George M. Riveire, head of The Goodyear Tire & Rubber Co.'s Washington, D. C., office, was recently elected president of the Washington Post of the American Ordnance Association; and **W. James Sears,** of The Rubber Manufacturers Association, Inc., was elected secretary-treasurer of the same organization.

William A. Karl, president of Firestone Textiles, a division of The Firestone Tire & Rubber Co., Akron, O., has received an honorary Master of Science degree from the New Bedford Institute of Textiles & Technology, New Bedford, Mass. Mr. Karl also gave the commencement address at the graduation exercises.

Robert S. Price has been appointed to the newly created position of general manager of the plastics division, Seiberling Rubber Co., Akron, O. Mr. Price joined Seiberling after 16 years with The B. F. Goodrich Co., in whose employ he held the posts of technical manager, general sales manager, and general manager of the plastics division at Marietta, O.

David R. Goldsberry is the new manager of the Seiberling Rubber Co.'s public relations department, responsible for all publicity and publications activities of the company. Mr. Goldsberry joined Seiberling in 1951, prior to which he had been a newspaper reporter for four years for the Athens, O., *Messenger.*

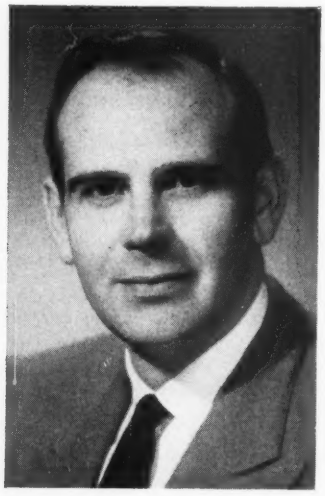
Orville E. Isenburg has been appointed general manager of Harmon colors, a subsidiary of B. F. Goodrich Chemical Co., which manufactures colors for paints, rubber, plastics, etc. Harmon maintains a color pigment plant in Haledon, N. J., and a dispersion and intermediates plant at Kearny, N. J., both of which are now under Mr. Isenburg's direction. The new general manager joined Goodrich in 1942, after having worked a short time in plastics and rubber research, and transferred to the chemical division in 1944. He has held the posts of field sales manager for plastics materials (1949) and international sales manager (1952) for Goodrich Chemical and was appointed sales manager of Harmon in 1953, when that company was acquired by Goodrich Chemical.

Norman J. Cyphers has been named director of research and development of Boston Woven Hose & Rubber Co., Cambridge, Mass. Prior to this appointment, Mr. Cyphers was vice president and technical director of Acme-Hamilton Mfg. Co. He also had been associated with Hewitt Rubber Co. for six years as technical supervisor.

Gerald Reinsmith, formerly Washington office manager for Narmco Industries, has been appointed factory manager of Narmco Metlbond Co., Chino, Calif. Mr. Reinsmith joined the firm in 1953 after 10 years with the Army Ordnance Corps as a materials engineer, prior to which he had been employed by Dow Chemical Co. from 1934-42.

James P. Sheridan was recently promoted to manager of pigment sales, western district, The New Jersey Zinc Sales Co., Chicago, Ill. Mr. Sheridan has been with the company for more than 31 years, the last 18 of which as sales representative in the pigment field.

Robert S. Price



Orville E. Isenburg

James P. Sheridan

M. F. Moyer, manager of Goodyear Tire & Rubber Co. cycle tire sales for the past eight years, has been named assistant manager of the firm's auto tire sales department. He is succeeded as cycle tire manager by **E. C. Sauter,** formerly district manager for the company at Pittsburgh, Pa. Mr. Moyer, with Goodyear since 1926 as a salesman, was assistant manager of the flooring division since 1928 and until becoming head of cycle tire sales. Mr. Sauter joined the company in 1921 and has headed a number of sales districts; the last was the Pittsburgh area, to which he was appointed in 1950.

James W. Kettle, former assistant director of U. S. Steel Corp.'s cost and statistics division, has been appointed controller of Stauffer Chemical Co., New York, N. Y., its subsidiaries, and associated companies.

Joseph F. Hutchinson, with Goodyear Tire & Rubber Co., Akron, O., since 1946 and superintendent of the metal products division since 1951, has been named assistant general manager of that division.

Raymond C. Firestone, executive vice president of The Firestone Tire & Rubber Co., Akron, O., was honored last month when presented at a special awards dinner following the 1954 Memorial Day 500-mile race at Indianapolis with the Edenburn Trophy as "the person connected with automobile racing deemed to have contributed the most to that sport during the year." Mr. Firestone received the award for the engineering and development of the new Indianapolis tire, sports car racing tires, and tires for international speed runs in Utah.

The industrial chemicals sales division of Carbide & Carbon Chemicals Co., 30 E. 42nd St., New York 17, N. Y., has announced the following changes: **M. W. Duncan,** technical representative, has been transferred to Denver, Colo., to handle the sale of the firm's organic chemicals in Colorado, Utah, and Wyoming; **J. R. Retter,** technical representative, has been transferred to Grand Rapids, Mich., where he will be in charge of sales of company products in western Michigan; and **M. R. Brannen** has been appointed technical representative, assigned to the St. Louis, Mo., district office.

Philip Salisbury, editor of *Sales Management,* and **T. H. Young,** director of advertising of United States Rubber Co., were among the panelists at the first session of the fifth annual *Chicago Tribune* Forum on Distribution and Advertising, held May 17 in the studio of radio station WGN and devoted to "Marketing to Raise the Standard of Living."

Erwin G. Hansen, formerly with the French Caliqua Co., Paris, France, has joined the J. O. Ross Engineering Corp., New York 22, N. Y., as a sales engineer. This appointment was made concurrently with the announcement that Ross has enlarged its headquarters space to accommodate the engineering, sales, and construction of "Supertherm" Caliqua hot water heating systems.

John P. Albade has been promoted to western area industrial sales manager of the adhesives and coatings division of Minnesota Mining & Mfg. Co., St. Paul, Minn. Mr. Albade joined 3M in 1947, rising through the positions of sales manager of the Chicago division and assistant industrial sales manager to his present post.

(Continued on page 574)

CANADA

Individual Consumption Up; Good Year Forecast

Canadians are now using 11 pounds of rubber per person per year, an amount second only to the 19-pound per person consumption in the United States. It is expected that Canada's figure, in a matter of years, will equal that of the United States, according to R. C. Berkinshaw, president of Goodyear Tire & Rubber Co. of Canada, who spoke at the recent annual meeting of the Rubber Association of Canada in Toronto.

Notwithstanding this increase (see table), the country's rubber industry does not expect to equal the all-time high sales total recorded in 1953. An average good year is predicted, however, despite the fact that new rubber consumption is expected to drop to the 1951 level. The forecast of decreased consumption in 1954 is based primarily on a 4% drop (to 12,205 tons) in new rubber purchases for the first two months, as compared to the same period last year, on the lessened activity being experienced in the agricultural implements, textile, and other industries and in view of increasingly severe import competition, particularly in footwear.

Other trends which will bear watching, in addition to the large increase of cheap canvas footwear from Hong Kong, are the continued downward trend of natural rubber prices; the abnormal increase in the domestic demand for tires; and the drastic drop in export demand for rubber products which has continued for the second successive year.

This declining export demand was very pronounced last year when only some $8.3 million worth of rubber products was bought by foreign customers, as compared to $17.7 million bought in 1952. When viewed relative to prewar years, when 30% of the industry's sales were made to foreign markets, 1953's decrease to 2% of total sales is striking. This year continues to exhibit the same declining pattern, with more than a 30% drop in exports for the first two months, as compared with the total exported in the same period in 1953.

Synthetic rubber production in Canada is not lagging, however, as can be seen by the expectation of the government owned Polymer Corp. to produce 83,000 tons in 1954. Broken down, this total will consist of 67,000 tons of butadiene styrene types, and 16,000 tons of Butyl types. It exceeds by more than 2,000 tons, the record production attained in 1953 by the corporation, including 53,186 tons of the general-purpose (butadiene styrene) types, 16,801 tons of Butyl types, and some 10,935 tons of specialty rubbers.

CANADIAN RUBBER CONSUMPTION

(In Long Tons)

	1952	1953
Crude rubber	31,297	34,106
Latex	2,203	3,376
Total, natural rubbers	33,500	37,482
Butadiene styrene types	27,111	28,680
Butyl types	4,197	4,541
Neoprene	1,697	1,894
Other	585	795
Total, synthetic rubbers	33,590	35,910
Total new rubber, natural and synthetic	67,090	73,392
Reclaimed rubber	13,597	14,596
Grand total	80,687	87,988

Ashley & Crippen

Norman S. Grace

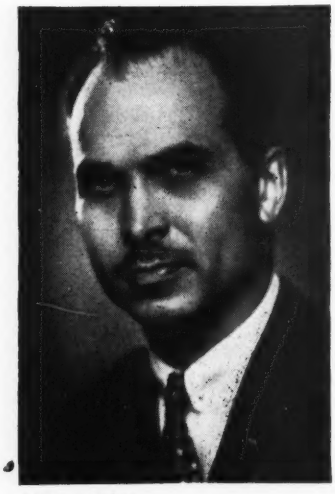
Dunlop Forms Research Center in Canada

The formation of a research center at Toronto, Ont., by Dunlop Rubber Co., Ltd. (England), to conduct work on new materials, chemicals, processes, techniques, and equipment peculiar to the rubber industry of North America has been announced. Construction of facilities for the new center at the Toronto headquarters of Dunlop Tire & Rubber Goods Co., Ltd., of Canada is now under way.

Heading the enterprise as general manager is Norman S. Grace, former chief chemist and technical superintendent of the Canadian firm. Assisting him is J. A. Carr, who previously had been in charge of process control and development for Dunlop's (Canada) pillofoam division.

The new installation will be closely associated with the Dunlop research center at Birmingham, England, and will attempt to keep the English facility abreast of the rapid advances being presently made in the United States and Canada. Much of the activity will be concerned with products of the petrochemical and synthetic rubber industries which are ahead of their British counterparts. To this end, laboratories for research involving polymer and organic chemicals and a physics department for raw material tests and low-temperature studies are being constructed.

Dr. Grace, who will also direct associated research work at the center related to mining, road and vehicle engineering, textiles, plastics, and compounding chemicals, will also continue to act as technical advisor to Dunlop-Canada. He has been employed by Dunlop since 1939, during which time he has served the Canadian Government on loan from the company. In addition to Mr. Carr, the general manager will be assisted by a staff whose members include R. T. Woodhams, formerly with Polytechnic Institute of Brooklyn, and A. D. Dingle.



Ashley & Crippen

J. A. Carr

"Andalfoam" Licensee Begins Operation

An expansion program which provides some 14,000 square feet of space and complete production facilities to coat fabrics with a thin gage of latex foam by means of the "Andalfoam" process has been completed by Dominion Silk Mills at Toronto, Ont.

The company has been licensed by Andrews-Alderfer Co., Akron, O., U.S.A., patent holder of the process, to use the technique in manufacturing the foam-fabric combinations. It is claimed that long lengths of almost any material can be coated with a foam thickness from 1/32- to 1/4-inch by means of this process. The finished products have found wide application as lining and insoles for shoes, floor coverings, mattress toppers, etc.

Dominion Rubber Celebrates Centennial

The one-hundredth anniversary of Dominion Rubber Co., Ltd., Montreal, P.Q., was celebrated last month with a ceremony and a special events program that linked the growth of the company with that of Canada in general.

Dominion Rubber, Canada's largest rubber company with four factories throughout the country, was founded on June 17, 1853, by Ashley Hibbard, Thomas Brown, and George Bourn. Its headquarters continue to occupy the same site on which it commenced operation, now the corner of Papineau and Notre Dame Sts. in Montreal.

Domestic Zinc Oxide Supply

Zinc oxide, much of which has long been imported, is now being produced at Milton, Ont., for consumption in domestic rubber, paint, ceramic, and pharmaceutical industries. Canadian Felling Zinc Oxide, Ltd., a British owned firm, is producing the material at a new, $150,000-plant on an 8½-acre site at Milton. Sale of the product will be handled by The Pigment & Chemical Co. of Toronto.

William E. Ireland, vice president of B. F. Goodrich Rubber Co. of Canada, Ltd., Kitchener, Ont., has been elected a director of that company. Mr. Ireland, who joined the organization 20 years ago, was also appointed vice president-sales with responsibility for all sales divisions of the Canadian firm.

Of Special Interest to Canadian Rubber Manufacturers...

The Rubber Regenerating Co Ltd

TRAFFORD PARK · MANCHESTER · ENGLAND

The Largest Producers of Reclaimed Rubber in the British Empire!

- ✱ *High grade reclaims from ALL NATURAL rubber scrap*
- ✱ *Competitive prices*
- ✱ *Prompt shipment*
- ✱ *Delivery direct to customer's plant*
- ✱ *Local stocks*
- ✱ *Continuity of supply*

For samples, prices and further particulars apply to our sole agents in Canada

H.L.BLACHFORD Limited

MONTREAL:- 977 Aqueduct Street

TORONTO:- 360 Old Weston Road

NEWS FROM ABROAD

MALAYA

Less Emphasis in Malaya on GR-S Price

The lack of agreement at the Rubber Study Group meeting in Colombo in May on methods of price stabilization and the coldness of United States delegates to the request for a raise in GR-S prices—even while they agreed to pass it on to Washington—caused relatively little disappointment in Malaya. To be sure, rubber men would have welcomed a clear-cut decision on a workable rubber price stabilization scheme, and they may have had hopes that the American delegates could have promised something more than merely to relay the plea for higher GR-S prices, but apparently the majority had not expected too much in the first place. Indeed, individual opinion that there is little real benefit in such an increase in synthetic prices is being heard more frequently.

H. A. Campbell, chairman of the joint working party of the rubber industry, is among those sharing this view, labeling the requested measure as a palliative which offers no real solution to the natural rubber problems. He prefers to meet synthetic rubber competition by unremitting research to improve quality and is a firm advocate of Technically Classified Rubber, which he considers at present to be one of Malaya's best weapons against synthetic. He would have leading rubber companies set up their own testing stations to further fullest development of T. C. Rubber production.

Over a Million Bales of T. C. R. Exported; Price Premium Considered

At both the Colombo meeting and the Singapore Quality & Packing Conference, the progress of T. C. Rubber came in for discussion. World production of T. C. R. in 1953 was about 50,000 tons, of which 27,837 tons, or more than half, came from Malaya. (Of the balance Indonesia put out 5,752 long tons, and Indo-China, 14,671 tons.)

The Rubber Research Institute of Malaya has two testing stations—a second one was erected toward the end of last year —with joint capacity of 80,000 tons. A third testing station in Malaya is that of the Socfin concern, the first to produce T. C. R. on a commercial scale.

The greater part of T. C. R. is estate rubber, mainly in RMA No. 1X and No. 1 R. S. S. Technical classification of packing house rubber has presented some difficulties, and production has developed at a very slow rate; only about 1,400 long tons of T. C. R. in RMA No. 1-5 grades (inclusive) were exported in 1953. But improvement is looked for. Modification of techniques has made it possible to classify increasing amounts of remilled rubber with remarkable success, and the first shipment, RMA No. 1 and No. 2 Thin Brown Crepes, left Malaya early in 1954. Encouraging demand for this rubber is reported. The Rubber Research Institute of Malaya now tests samples from 119 estates, three packing houses, and two remilling factories.

A question that has recently come up is whether a premium should be charged for T. C. R. It is realized that because T. C. R. is so readily disposed of, there is a temptation on both sides of the water to tack a premium on to the market price; in the case of remillers and packers, who work on a small margin of profit, it may actually be needed. Not many producers seem to be getting a premium, and apparently most do not desire it, on the assumption that a premium might put off prospective buyers of T. C. R. Indeed, the suggestion is said to have come from this group that some purely local incentive be offered instead, to encourage T. C. R. production.

Rubber Roads in Dispute

One of the points made at the Colombo meeting of the Rubber Study Group in May was that the best way to stimulate greater use of rubber was to employ it in the improvement and extension of road systems. Commenting on this opinion, S. Pitt, acting director of the Federation Public Works Department, mentioned technical difficulties as obstacles in the way of such programs. He explained that in current road tests, engineers in Malaya found it hard to incorporate rubber with bitumen and reportedly expressed the view that before attempts were made to use rubber in roads on a large scale, it was necessary to have convincing proof of its beneficial effect on the life and riding qualities of road surfaces.

Meanwhile, it is learned that K. Nankivell, director of the Public Works Department, and S. E. Jewkes, engineer in charge of the Department, have been commissioned by the Federation Government to visit the United States to study latest developments in rubber roads in America and particularly the incorporation of rubber in road-surfacing materials. The officials are scheduled to leave for New York in July and are to tour the country for two weeks.

UK Rubber Inquiry Mission Appointed

A three-man mission of inquiry from the United Kingdom was expected to arrive in Malaya during June. The mission, which, it is understood, is under Sir Francis Mudie, former head of the British Economic Mission to Yugoslavia, is to spend two or three months in Malay to inquire into the competitive position of the Malayan rubber industry. It will consider:

(1) Taxation of the industry in relation to production costs;
(2) Maintenance of existing capital in the industry and attraction of fresh capital for its development;
(3) Replanting;
(4) Marketing and processing of smallholder rubber;
(5) Unemployment in the industry in the event of a recession in price.

A joint working party appointed by the government and the Rubber Producers' Council has for months been collecting relevant information to provide necessary background data.

Claim Rubber Publicity Misdirected

Publicity by the Natural Rubber Bureau in Washington, D. C., U.S.A., recently came in for strong criticism from an important section of Malayan rubber estate owners. Members of the United Planting Association of Malaya complain that the efforts of the Bureau to "educate" the American public by explaining how rubber is produced and describing living conditions in Asia through expensive advertisements in the leading dailies and magazines serve no useful purpose, since consumers of rubber goods are only interested in the products they buy and not in rubber growing. Cheaper and better rubber is the best advertisement, they feel.

The occasion that brought out these criticisms was a discussion of the need of raising the rubber fund cess. North Malaya representatives of the Association stated flatly that they did not object to an increase in the cess from half a cent to one cent a pound, if it was necessary for research and propaganda, but that they were opposed to any increases unless the Bureau was reorganized into a smaller and cheaper body maintaining liaison between the natural rubber industry and the consumers, and that at least $600,000 (U. S. currency) a year could be saved.

GERMANY

Night School for Rubber Technicians

With the approval of the government of the State of Hesse, Germany, and in cooperation with the Government Engineering School, Frankfurt a.M., Deutsche Dunlop Gummi Compagnie, A.G., Hanau a.M., set up, in the beginning of 1950, the first evening school in Germany for rubber technicians. This school is designed to give workers in rubber factories, who have the necessary practical experience, the opportunity of acquiring such additional technological and scientific knowledge as will enable them to fill higher positions, as rubber technicians, in factory, experimental departments, and laboratories as well as in the offices and in outside work. The complete course offered takes seven semesters of 20 10-hour weeks each and covers mathematics, industrial physics, chemistry, mechanics, mechanical drawing, machine parts, technology of rubber, metals and textiles, practical electro-technics, energy supply, automobiles and tires, cost accounting, and factory management.

In July, 1953, the first course was completed, and 28 persons, of various ages and educational backgrounds, received their diplomas after having passed the required state examination.


for the BEST...
in rubber and plastics
LOOK TO MUEHLSTEIN
For example—HARD RUBBER DUST
Muehlstein offers complete grinding facilities and strict laboratory control for hard rubber dust—manufactured and ground to your specifications. Also, you have your choice of all standard grades regularly available. And, don't forget, in Muehlstein you have a complete technical service with modern, newly-expanded laboratory facilities ready to help you solve your manufacturing problems.
And remember, there are many other Muehlstein products, too, including REPROCESSED PLASTICS • SCRAP RUBBER • CRUDE RUBBER SYNTHETIC RUBBER
MUEHLSTEIN & CO. INC
60 EAST 42nd STREET, NEW YORK 17, N. Y.
CRUDE RUBBER · SYNTHETIC RUBBER · SCRAP RUBBER · HARD RUBBER DUST · PLASTIC SCRAP
BRANCH OFFICES: Akron · Chicago · Boston · Los Angeles · Memphis
WAREHOUSES: Akron · Chicago · Boston · Los Angeles · Jersey City

For European Cooperation

It is worth noting that the habit of viewing matters in business and industry from a European and not solely from a national standpoint seems to be growing in Germany. In the rubber industry, leaders have repeatedly urged European collaboration on synthetic rubber production, and in other industries too there is a growing realization of the need of European cooperation.

A definite step in this direction by the rubber industry was taken at a meeting of the Committee for Studying Rubber, formed under the ELEC (European League for Economic Cooperation) held in Koenigstein (Taunus), October 19, 1953. The object in view seems to be eventual unification and regulation of the European rubber goods market. It was recognized that a prerequisite for fruitful discussion of necessary measures to be taken to further this end is a picture of production methods, costs, and rubber consumption in the various countries. Representatives of several European rubber concerns were present, including the head of the Semperit concern of Vienna, Baron von der Lippe (who presided at the meeting); Otto A. Friedrich, general director of Phoenix; Hubert Greiveldinger, of Kleber-Colombes, Paris, France; Vice President Schiff, of the Vredestein company of Holland; and Michele Mosca, of Pirelli, Milan, Italy. It was planned to continue discussions at the end of January, 1954.

Supersonic Tire Testing Device

A new supersonic device to detect air bubbles and fabric separation in automobile tires has been constructed by Dr. Lehfeldt & Co., for the Continental Gummi Werke, A. G., Hannover, in collaboration with the firm's research and development department. This is the first apparatus of the kind to work with a frequency of 100 kHz; similar devices developed in the United States and England operate with only 50 and even 40 kHz and, in general, are only capable of detecting the larger defects. The new German mechanism, working with a much higher frequency and, in addition, equipped with special elements, detects the smaller flaws also.

Testing occurs in a water bath. The sound transmitter is placed inside the tire to be examined, and the supersonic waves emitted penetrate the tire wall and are uniformly intercepted by 10 sound receivers. Since the speed of sound is approximately the same in rubber and in water, the sound waves can pass through the test piece practically unrefracted and without disturbing reflections at the rubber-water boundary.

When the supersonic waves are reflected by an air bubble or separation of fabrics, a red light automatically goes up, and at the same time the flaw is automatically recorded.

ACHEMA XI Scheduled for May '55

The ACHEMA XI, to be held May 14-22, 1955, in Frankfurt a.M., has already shown signs that it will surpass the memorable ACHEMA X of 1952, it is learned. About 50% more space will be required to house the thousands of exhibits, including apparatus and equipment, machinery, regulating and controlling devices, and materials used in chemical laboratories and plants. More than 600 firms, including 62 foreign concerns representing 11 different countries, have already reserved stands.

As usual a congress is to be held in connection with the exhibition, and by way of introduction to both, the "Achema Year Book, 1953/55," is to be issued in the Fall of 1954; it will be the first European catalog of the chemical apparatus and equipment industry. It will appear as a single, tri-lingual (English, French, and German) volume and will be supplied gratis to those participating in the congress.

Fifth Plastics Conference

The Fifth Plastics Conference, held in Hamburg, October 7-9, 1953, again reflected the cooperation of science and industry in this field in Germany, resulting as it did from the joint efforts of various scientific and producers' associations.

Daily attendance at the sessions averaged well over 1,000 persons, including 98 foreign visitors, an indication of the interest in the 23 lectures offered by experts, for those connected with research and production in the plastics field.

Advance information given to the press outlined the remarkable recovery of the German postwar plastics industry. In 1939 world production of plastics had been roughly 350,000 tons, of which the United States and Germany each produced about 100,000 tons. By 1944, German output reached 250,000 tons, the highest for the country so far. During the next few years occurred an in-

Bags, cures, de-bags in half the time with TIMKEN® bearings on eccentric shafts

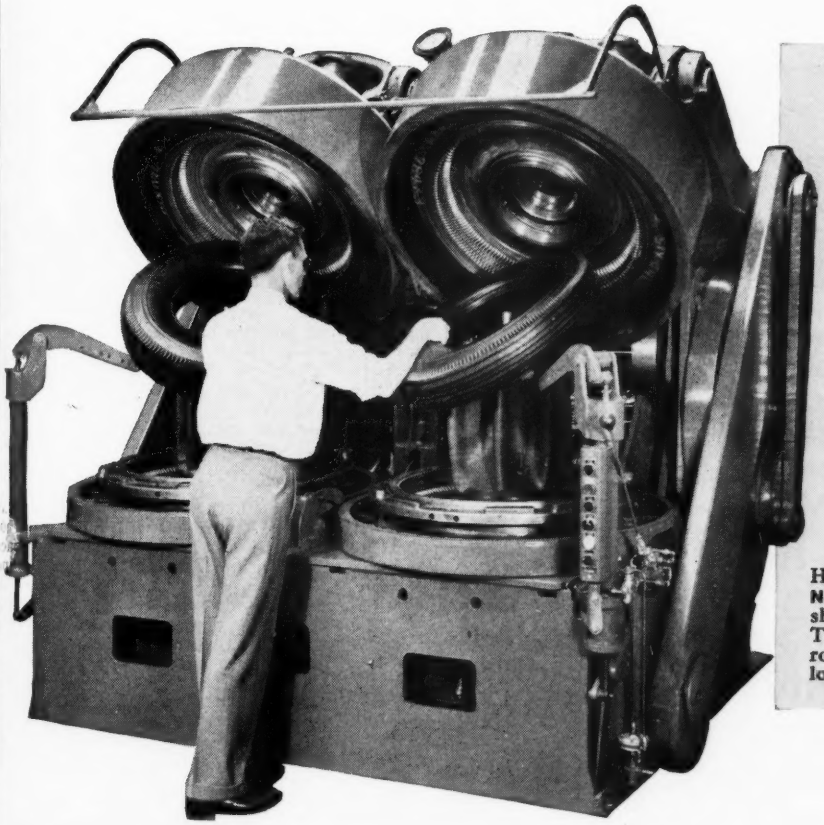
THIS new McNeil Bag-O-Matic Tire Press bags, cures and de-bags, does the work of three separate machines—and in half the time. To carry the heavy overhung load of the connecting link, McNeil mounts the eccentric shafts on Timken® tapered roller bearings.

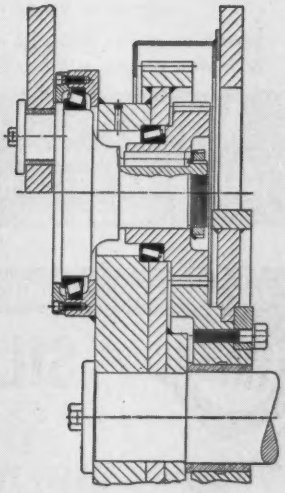
Line contact between the rollers and races of Timken bearings gives extra load-carrying capacity. And Timken bearings take both radial and thrust loads in any combination because of their tapered design. Eccentric shafts are held in positive alignment. Wear on moving parts is reduced. Maintenance costs are less, too.

There's less power loss in the McNeil Bag-O-Matic because the true rolling motion and extremely smooth surface finish of Timken bearings practically do away with friction. And the steel in Timken bearings is the highest quality ever developed for tapered roller bearings—Timken fine alloy steel. The Timken Company is the only bearing maker in the U. S. A. that makes its own steel.

Get long life and dependable performance in the rubber machinery you build or buy. Insist on Timken bearings. Look for the "Timken" trade-mark on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.





How **McNEIL MACHINE AND ENGINEERING CO.** mounts eccentric shafts of its Twin Bag-O-Matic Tire Press on Timken tapered roller bearings to carry overhung loads.

WE MAKE OUR OWN STEEL

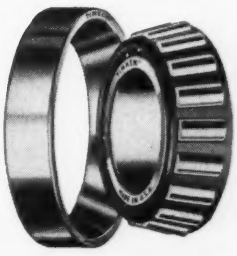
The special grade alloy steel which gives Timken bearings their strength and resistance to wear is made in our own steel mills.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ↓◎↑ AND THRUST →◎← LOADS OR ANY COMBINATION →✳←

terval of low activity, but then came the upturn, and in 1952, Germany was again producing close to 200,000 tons of plastics, representing about 12.3% of world production. The 1953 output has been estimated at 225,000 tons for Western Germany alone. In other words, the wartime peak for all Germany is about to be reached by only a part of the country, and Germany is once more the biggest European producer of plastics, and after the United States, the second largest in the world. The value of the 1953 output is expected to be 1,500,000,000 DM.

Official statistics put the total exports of plastic materials and products at 18,243.6 tons, valued at 90,279,000 DM for the first half of 1953. Imports in the same period amounted to 6,935 tons, valued at 27,283,000 DM, and consisted mainly of raw materials.

Company Trade Notes

Business men in all fields have followed with interest a case in which a manufacturer successfully sued a customer for selling his branded goods below the prices fixed by him. This case is the first of the kind to come up since the Allied authorities permitted the resumption of price fixing in the Federal Republic toward the end of 1952.

Farbwerke Hoechst A.G., Frankfurt a.M., and Vereinigte Glanzstoff-Fabriken, A.G., have been licensed by Imperial Chemical Industries, Ltd., England, to manufacture Terylene fiber in Germany.

Rheinische Olefinische G.m.b.H., a joint enterprise of Badische Anilin-und Soda-Fabrik, A.G., Ludwigshafen, and Deutsch Shell A.G., Hamburg, has been formed to produce polyethylene and ethyl benzene, based on petroleum. A factory is being erected in the Wesseling area, between Bonn and Cologne, and refinery gases from a nearby petroleum refinery plant will be processed. This enterprise, expected to go into production early in 1955, will be the first of its kind in Germany.

The proprietors of the firm, Vorwerk & Sohn, Wuppertal, Wilhelm and Max Vorwerk, who are sole stockholders in Gummiwerke Fulda A.G., have announced their decision to assume personal liability for this company, whose name at the same time will be changed to Gummiwerke Fulda, Kommanditgesellschaft auf Aktien.

On January 7, 1954, Carl Ruger, general manager of Metzeler GummiWerke, A.G., Munich, completed 25 years with the company. Herr Ruger has constantly exerted himself in behalf of the German rubber industry and soon after the end of the war was made chairman of the German Association of Rubber Manufacturers. He is also a trustee of the German Rubber Institute and a member of the Council of the Board of the Deutsche Kautschuk Gesellschaft, in the reestablishment of which he took a leading part. In recognition of his services to the rubber industry and to rubber technology, and of his qualities of leadership, the D.K.G. on this occasion presented Herr Ruger with its Plaque of Merit and a Diploma.

Farbenfabriken Bayer, A.G., has developed a method of coloring its polyamid filaments, known as Perlon, by adding color to the spinning solution. It is claimed that merely by mixing salmon tints or blue with white, 30 different shades are thus obtained. The company is to dye two-thirds of its monthly output of 150 tons of Perlon filament by this process.

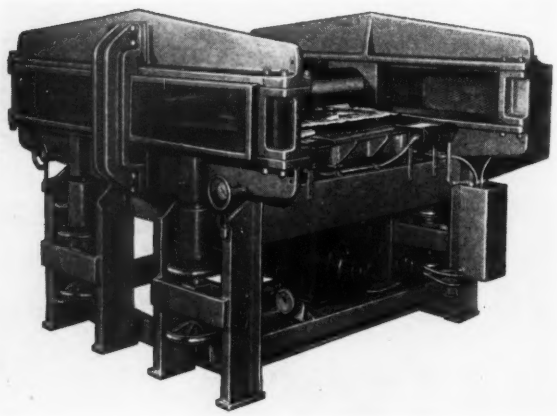
On August 28 the new administration headquarters of Continental A.G., Hannover, were opened with much ceremony in the presence of a large number of friends and important government and business personalities. The 15-story building, almost 200 feet high, is the tallest postwar structure in Western Germany. With its erection—which took 21 months—Continental's 110,000,000-mark reconstruction program, involving the rehabilitation of three Hannover plants, has reached completion.

The 1954 general meeting and conference of the Deutsche Kautschuk Gesellschaft (D.K.G.) are to be held October 21-23, in Munich, when German and foreign experts will discuss questions of rubber chemistry, physics, and technology, rubber testing, textiles for the rubber industry, and machinery.

To encourage qualified young men to undertake scientific studies on chemical, colloid-chemical, physical, and technological problems calculated to further rubber research, and at the same time to aid them, D.K.G. will offer three prizes (700 DM, 500 DM, and 300 DM) for the three best scientific papers sent in before July 1, 1954. The contest is open to students and assistants without fixed income who are German citizens. Foreign students may also compete, but they are not eligible for the cash prizes, and their meritorious works will only be recognized by the society's certificate to that effect.

During 1953, West Germany produced about 240,000 tons of plastics, showing an increase of more than 25% over the 1952 total. Included were 105,000 tons polymerization products (against 81,000 tons in 1952), 95,000 tons condensation products (against 80,000 tons), and 37,300 tons of cellulose derivatives (against 28,800 tons).

New Machinery



Heavy-Duty Roller Die Cutting Machine

Roller Die Cutter

A HEAVY DUTY roller die cutter, similar in construction and operation to previous models of the company, has been introduced to industry by Falls Engineering & Machine Co., Cuyahoga Falls, O. A greatly increased capacity over that of the previous models for making simultaneous cuts of tough materials such as uncured rubber, composition rubber soles, molded rubber goods, glass fiber, foam and sponge rubber, etc., is claimed for the new machine.

Principle of operation of the unit is the same as for a printing press. This involves a motorized traversing steel roll which moves across the bed area of the machine in five seconds. The roll presses the material on to inexpensive steel rule dies in which foam or sponge rubber is used as a "kick-out" medium. The number of cuts that can be made simultaneously with the machine is limited only by the size of the bed. The size, in turn, can be designed for the particular user's requirements.

Small Hydraulic Press

A 60-TON, H-type hydraulic press, Model PA-7, has been introduced by Pasadena Hydraulics, Inc. (formerly Preco Press), Pasadena, Calif. Capable of use for plastic and synthetic rubber molding, plastic laminating, etc., and for testing applications, the unit can be manually, pneumatically, or electrically operated to develop the required ram pressure.

PHI Hydraulic Press, Model PA-7

The new machine stands only 43 inches high and features 18- by 18-inch platens that are equipped with cooling coils and Calrod heating units for temperature control. With manual pumping, 13 strokes are required for a ram travel of one inch and approximately 35 strokes to raise the ram pressure from 0-60 tons. With a Powermatic air pump, 90 pounds of air are necessary for the same amount of ram travel in eight seconds and for developing the maximum possible load. Other specifications for Model PA-7, modifications of which can be made to suit customer requirements, include: ram diameter, 6¾ inches; stroke, 4½ inches; base dimensions, 24½ by 24½ inches; and weight, approximately one ton.

Component Parts of Foxboro Air Filter

Air Filter

A COMPACT air filter, designed to prevent dirt, oil, water, and other foreign matter from entering pneumatic instruments, has been announced by Foxboro Co., Foxboro, Mass. The unit can handle up to four cubic feet a minute of air or natural gas at pressures up to 150 pounds.

Four major elements comprise the filter: a top cap with supply and outlet connections; a chamber with a drain cock at the bottom; a resin impregnated filtering sleeve; and a water baffle. Supply air enters, strikes a baffle plate on the cap, enters the chamber, passes through the filter, and leaves through the outlet port. The filter sleeve of cellulose can remove particles as small as 40 microns, according to the company.

Specifications for the air filter include: sump capacity, 12 cubic inches; filtering area, 21.2 square inches; connections, ¼-inch; and overall dimensions, 8½ by 4⅛ inches.

Granulator Series

FOUR new granulators are being offered by Alsteele Engineering Works, Inc., Framingham, Mass., for use in breaking up plastics, chemicals, etc. These include a 4½- by six-inch throat model, caster mounted and completely self contained in an area of 1½ square feet; a five- by 10-inch throat unit, with a five-hp. motor; a seven- by 18-inch throat opening model, with a 25-hp. motor; and a nine- by 24-inch unit, with a 40-hp. motor. The smallest unit, equipped with a 1½-hp. motor, contains a specially engineered conveyor that permits refeeding of granulating material.

Features of the all-steel granulators include the double-supported, hardened rotors; ease of field stripping; and the absence of dust and flyback material. Dicing and chopping equipment is available as attachments to the standard machines.

Model S Beta Gage with Recorder

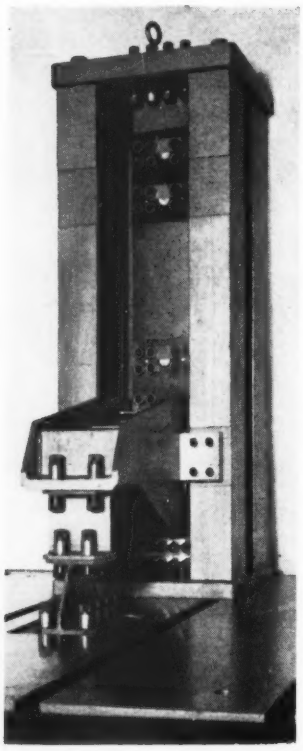
Low Priced Beta Radiation Gage

MODEL S beta radiation gage, a low priced instrument designed to provide accurate weight or thickness measurements of material in continuous process industries where the rate of production is low, or production is intermittent, has been announced by Industrial Nucleonics Corp., Columbus, O. Capable of measuring sheets up to 24 inches in width, the new model employs two basic components: a source-detector unit which utilizes a radioisotope; and a control console.

Similar in design to previous radiation gages of the company, the source-detector unit is a U-shaped device through whose throat

passes the sheeting to be measured. Dimensions of this component are: length, 36 inches; width, 10¾ inches; and height, 24½ inches. The console cabinet, which houses the power supply, measuring and standardizing circuits, and indicating meter, is capable of being placed at any convenient location.

Fixtures for Fatigue Testing Machines



Sonntag Five-to-One Multiplying Fixture

TWO fixtures, one for increasing the fatigue testing capacity fivefold and the other for making possible the fatigue testing of stock as thin as 0.010-inch, have been developed by Baldwin-Lima-Hamilton Corp., Philadelphia 42, Pa., for use with Sonntag fatigue testing machines.

The multiplying fixture will permit testing materials under loads up to 50,000 pounds on a 10,000-pound capacity machine. Designated the Sonntag Five-to-One, this accessory is especially suited for testing flat samples, and with proper adapters, can accommodate round specimens as well. Physically, it is constructed with a 17¼-inch vertical space between the top of the loading member and the upper fixed platen, and with a nine-inch lateral space between the columns. Operation is based on a simple lever principle whereby a flex-plate is used as the fixed pivot for a 30-inch lever. This lever is vertically vibrated by the oscillator of the fatigue testing machine. Loading is accomplished through another flex-plate located six inches from the fixed pivot, with the loading member being guided to move vertically by horizontal flex-plates in order to prevent bending of the specimen. This principle limits specimen deflection to 0.050-inch, according to the company.

The accessory fixture which permits determination of the fatigue properties of thin stock is furnished with the Sonntag SF-2-U testing machine. Its operation involves holding one end of the specimen fixed and the other end free but guided in such a way as to produce maximum stresses in two lines across the specimen instead of one line. A new specimen shape is required. Stresses are produced by forging the specimen into an S-curve or reversing S-curves at 1,800 cycles per minute. Machine capacity, with an amplifying fixture, is given as 50 pounds, with maximum deflection of ½-inch.

Machine Productive and Down Time Recorder

MODEL M SERVIS RECORDER, used to provide a visible record of the busy and idle time of plant machinery, has been introduced by The Service Recorder Co., Cleveland, O. Also useful in time studies or as a check on the exactness of processing operations, the new instrument requires only a wire connection to the machine's motor, which makes possible the remote location of the recorder itself.

The actual recording is done by a sapphire stylus on a wax-covered chart. The standard 24-hour (six-inch chart) can revolve three times if desired, permitting three days of readings to be obtained. Also capable of three-revolution recordings are the 12-, eight-, and four-hour charts and clocks.

In operation, a mechanical clock in the instrument is wound when each new chart is inserted. Functioning of the machine being checked actuates a synchronous motor which records until the machine is stopped. Various accessories for the unit are available, including a series relay for solving hook-up problems, an elapsed timer, and a counter.

New Materials

Surface-Active Lignin Derivatives—Polyfons

THE Polyfon series of surface-active chemicals based on lignin has been announced by West Virginia Pulp & Paper Co., Charleston, S. C., in a new technical bulletin (No. 301). Described as sodium lignosulfonate, the chemical is available in five grades for use in dispersing organic and inorganic pigments and cellulose acetate, vat, and sulfur dyes.

The grades are graduated according to the content of sodium sulfonate groups; such content ranges from 5.8-32.8%. Intermediate grades of the chemical can also be made on order, according to the company, which represents the Polyfons to be free-flowing, amorphous brown powders soluble in water to give alkaline solutions. All grades can be stored indefinitely either dry or in solution without mold growth or fermentation.

Vinyl Film—Ultron R-127

PRODUCTION of an Ultron vinyl film for use in the fabrication of inflatables, including toys, swimming pools, air mattresses, and pillows, has been announced by Monsanto Chemical Co, Springfield, Mass. Excellent heat sealing properties and uniform extensibility are advantageous characteristics claimed for the new material, designated Ultron R-127.

Available in a special color line consisting of white and five colors, the film has a smooth surface to facilitate printing. It has a tensile strength of 2,520 psi., 100% modulus of 1,240 psi., and an elongation of 325% (ASTM D412-51 average values). The product is supplied in widths ranging from 36-72 inches.

Benzoate Plasticizer—Flexol 77-G

DIPROPYLENE glycol dibenzoate, a synthetic resin plasticizer known as Flexol 77-G, has been announced as available from Carbide & Carbon Chemicals Co., 30 E. 42nd St., New York 17, N. Y. Completely compatible with polyvinyl chloride, polyvinyl acetate, polyvinyl butyral, ethyl cellulose, polystyrene, acrylates, and cellulose acetate butyrate (37% butyral content), the new material is especially recommended for use with PVC because of its high solvent power for that resin.

In PVC, it is claimed to promote rapid fluxing of calendering and extrusion compounds and to act as a fusion aid in organisols and plastisols. The resistance of Flexol 77-G to extraction by mineral oils and gasoline is said to be comparable to that of high molecular weight polyesters.

Physical properties given for Flexol 77-G include:

Molecular weight	342.38
Specific gravity at 20/20° C	1.1260
Boiling point at 10 mm., °C	250
Vapor pressure at 200° C., mm	1.2
Viscosity at 20° C., centipoises	214
Pour point, °C	−12
Freezing point, °C	Sets below −30

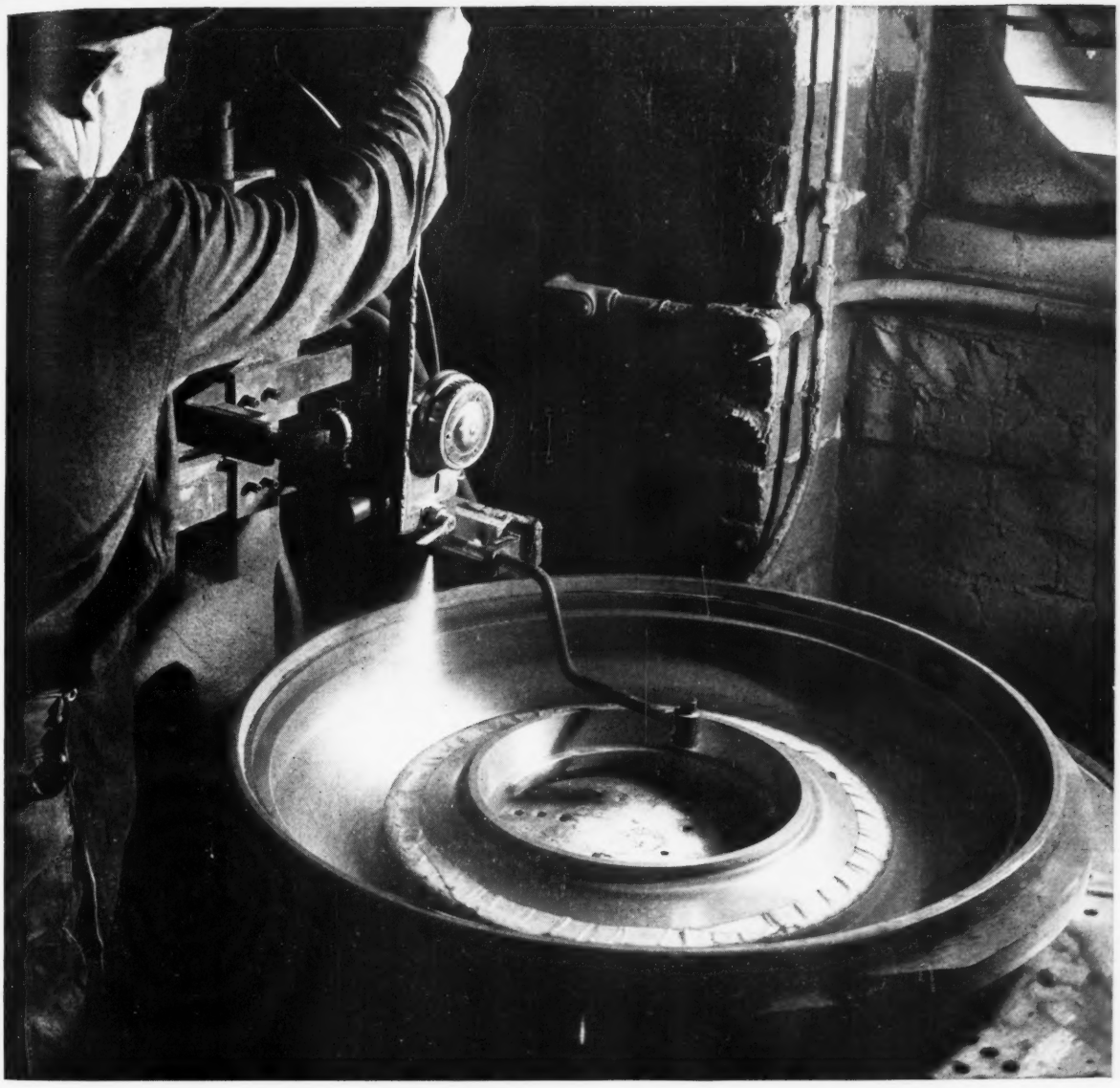
Neoprene Maintenance Coating—Magic-Vulc 245-B

A THICK, paint-like liquid of high solids content, which can be applied by spray or brush as supplied, has been introduced by Magic Chemical Co., Brockton, Mass., to complement its protective coating line of vinyl plastisols recently announced.[1] Feature of the neoprene-containing product is that it does not require the addition of a primer or accelerator, making possible its use directly from the can in which it is obtained.

Available in a standard black color, with aluminum and other colors possible, the Magic-Vulc neoprene coating is reported to dry in two hours to form a tough film 5-10 mils thick. The characteristic properties of neoprene (water and chemical resistance) are claimed. Elastic to cope with extreme weather conditions and rapid temperature changes, the film is also capable of being easily repaired if damaged.

Coverage with the product, reported to have a long shelf life, is given as 75-100 square feet per gallon.

[1] See our June, 1954, issue, p. 402.



THIS HOT SPRAY GIVES CORROSION A COLD SHOULDER

THE photograph above shows a very important operation in the manufacture of aluminum insert tire molds in our Athens, Ohio plant.

Wherever an aluminum insert is to be used the cavity is sprayed with molten aluminum to provide a positive means of preventing electrolytic corrosion of the insert. This spray coat of molten aluminum forms an integral bond with cast iron, cast, forged or welded steel . . . avoids the contact of aluminum inserts with a dissimilar metal.

Metalizing is typical of the care with which we approach every step in the making of tire molds. Our plant at Athens is, we believe, the only plant in the world devoted exclusively to tire mold manufacture. Here, specialized machines and machine tools (many of our own design) and craftsmen thoroughly skilled in their use, produce tire molds of superlative quality — and at decidedly favorable cost.

ATHENS MACHINE DIVISION

THE BRIDGWATER MACHINE COMPANY

Akron, Ohio

FOR BETTER MOLDS FOR BETTER TIRES *SPECIFY* BRIDGWATER

Encapsulating Silicone Rubber—Silastic S-2007

A RESILIENT dielectric coating material for extreme temperature electric and electronic components has been developed by Dow Corning Corp., Midland, Mich. Identified as Silastic S-2007, the new silicone rubber cures in two to four hours at 200° C. to form a rubber-like jacket which is uniform, heat-stable, moistureproof, and highly resistant to oxidation, ozone, and weathering, according to Dow.

Supplied as a solvent-free, low-consistency paste, Silastic S-2007 may be applied by dipping or vacuum impregnating, or may be molded in fitted encapsulating molds. Coated parts can be placed directly into a hot air oven for vulcanization, requiring neither pressure nor a graduated cure to achieve the desired properties. Normally white, the stock may be tinted any shade by the user, Dow states.

Fully cured coatings have a hardness in the range of 40 durometer, Shore "A" scale, and can easily pass the moisture resistance and low-temperature flexibility requirements of MIL-T-27 grade 1, the company believes.

Inks for Vinyl Plastics

A SERIES of "Vinyl Inks" in concentrated form for use in gravure and silk screen printing of rigid vinyl plastics is available from Claremont Pigment Dispersion Corp., Brooklyn, N. Y. Various "Topping Clears" for use over the inks are also obtainable from the company.

Printing of these products is said to exhibit exceptional resistance to abrasion and blocking. In tests on film which had been aged for 24 hours, 500-gram prints mounted on CS17F wheels of a Taber Abraser sustained 55 cycles before top breakthrough, and 600 cycles before complete breakthrough. Similar printed film withstood five pounds of pressure for 48 hours at 180° F. without blocking, according to a company report.

As supplied, the inks weigh from 7-10 pounds per gallon, 20-50% of which is solids, with a mixture of ketones making up the remaining portion.

Synthetic Rubber Processing Resin—Solarite #11

SOLARITE RESIN #11, a hydrocarbon material that has a marked similarity in structure to natural rubber when investigated by the infrared spectrophotometer, has been introduced to the rubber industry by Solar Compounds Corp., Linden, N. J. Recommended for use as an additive to synthetic rubbers such as GR-S, Butyl, and neoprene (to maintain elongation on aging, increase modulus and hardness, etc.), the new material is also claimed to be highly compatible with natural rubber and other synthetics.

It processes without "mushiness," is suitable to both pure gum and highly loaded stocks, and maintains its electrical characteristics despite severe aging and ozone exposure, it is claimed. Chemically, this material is resistant to alkalies, acids, and water; non-saponifiable; and soluble in aromatic and aliphatic hydrocarbons, the manufacturer states.

The resin is supplied in amber colored, very friable lumps with a melting point between 170-180° F., an estimated molecular weight of 630, and a specific gravity range of 1.01-1.02. Other specifications given for the material include: acid number, 2-4; odor, none; and refractive index, approximately 1.4.

Test results of loadings in various synthetic rubbers are contained in a bulletin published by R. E. Carroll, Inc., Trenton, N. J., exclusive sales agent in this country. Export sales of Solarite Resin #11 are handled by Paul J. Pauls, Inc., Plainfield, N. J.

Butadiene-Based Petrochemical—C-Oil

A HEAVY bodied, sticky, almost colorless liquid based on butadiene has been developed by Standard Oil Development Co., New York, N. Y., for use in the manufacture of products that must be greatly resistant to scratching, harsh chemicals, and other abuses. Among such products that have been fabricated on a limited scale are paints and surface coatings (Glidden Co. has been licensed to develop these applications) and glass-like plastics which may be machined almost like metal, according to the company.

C-Oil, as the new material is called, can be obtained in semi-commercial quantities at present. It is soluble in aliphatics and aromatics and, when dissolved to form a 50% solution, has a viscosity of 1-7 centipoises (at 25°C.). C-Oil is also represented as having an iodine number of from 165-170.

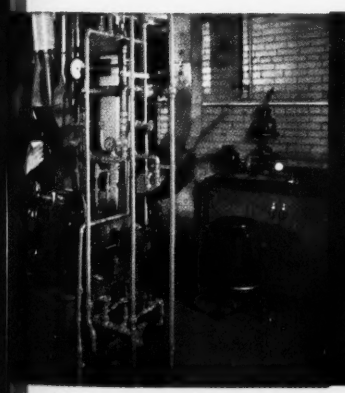
Solving your Carbon Black problems

WITCO-CONTINENTAL Laboratories

Our aim is always to assist you

WITCO-CONTINENTAL's Carbon Black Laboratory is devoted expressly to help you solve your carbon black problems through technical service and research. Our experienced staff utilizes the most modern methods and equipment to improve your product by finding more efficient rubber formulations.

Modern in every detail, the WITCO-CONTINENTAL Carbon Black Laboratory is at 1400 W. 10th Ave., Amarillo, Texas.



bury mixer with internal temper-
e recorder assures homogeneous
ding of every ingredient in each
er batch under test.

Constant temperature-humidity test room contains Scott tensile strength testers. Center unit tests tensile at elevated temperatures.

Rubber mill room holds rubber mill, steam vulcanizer, exact temperature curing presses, full instrumentation for completely accurate test results.

For the complete line of Witco-Continental Rubber Blacks

Witco-Continental CARBON BLACKS

Recognized *for over twenty-five years* as dependable Carbon Blacks for rubber products of superior quality.

Channel Blacks

Continental® AA—Easy Processing (EPC)—Witco No. 12
Continental A—Medium Processing (MPC)—Witco No. 1
Continental F—Hard Processing (HPC)—Witco No. 6
Continental R-40—Conducting (CC)

Furnace Blacks

Continex® SRF—Natural Gas Type, Semi-Reinforcing
Continex SRF-NS—Natural Gas Type, Non-Staining
Continex HMF—Natural Gas Type, High Modulus
Continex HAF—Oil Type, High Abrasion
Continex FEF—Oil Type, Fast Extruding
Continex SAF—Oil Type, Super Abrasion

Witco-Continental's technical service staff will be glad to assist you with your rubber formulation problems.

WITCO CHEMICAL COMPANY
CONTINENTAL CARBON COMPANY
260 Madison Avenue, New York 16, N. Y.

Akron · Amarillo · Los Angeles · Boston · Chicago · Houston
Cleveland · San Francisco · Atlanta · London and Manchester, England

A
Logo
surfa
and
a Lo
Sil
whic
excel
hardn
suppl
Pa
clear
is fi
Whe
on o
Esser

A
and
Co.,
form
tensil
Cap
adhes
solver
type
densit
at 22

TWO
ha
plastic
N. Y
thesiz
cosity
combi
ties in
Pro
lightw
and
hard
sure
Furth
makes
fillers
are ca
glass,
rapid
by-pro
use o
The
liquid
their
eners

Specific
Viscosi
Assay:
Epox
gra
Amin
Flash p
open
Storage

Mix
which

Resins
BR-187
1879

July,

Satiny Plastic Finish—Logo Essence

A FINISHING material, said to impart a satin appearance similar to natural pearl essence, has been developed by Logo, Inc., Chicago, Ill., for use as either a first or second surface (i.e., top or bottom) of polystyrene, acrylic, butyrate, and acetate. Known as Logo Essence, the finish is applied in a Logoquant base by spraying.

Silky white in color, this finish dries to a translucent film which has the properties of the base, including good gloss, excellent adhesion, humidity resistance, and a good degree of hardness, according to the manufacturer. This new material is supplied as a liquid weighing seven pounds per gallon.

Particularly recommended for use on the second surface of clear plastic (to be viewed through the plastic), Logo Essence is first applied and then backed up with the desired color. When used on the first surface, the desired base color is sprayed on or molded into the plastic and then a top coating of the Essence is applied.

Latex Flocking Adhesive—RFA17

A LATEX based, curing-type adhesive, called RFA17, which can be used for flocking on milled rubber, foam rubber, and latex rubber has been developed by Polymer Dispersions Co., Staten Island, N. Y. The new material can also be used to form a reinforcing skin on foam rubber to increase the rubber's tensile and tear strengths, according to the firm.

Capable of application either by spray or by machine, the adhesive is composed of 42% solids in a water solution (clean-up solvent is any aromatic liquid). Its viscosity, depending on the type of application, ranges from 500-10,000 centipoises, and its density is 8.2 pounds per gallon. Curing time is given as one hour at 225° F.

C-8 Epoxy Resins and Hardeners

TWO new epoxy resins and a group of four complementary hardeners for use with the resins have been added to the plastic line of the Bakelite Co., 260 Madison Ave., New York 16, N. Y. The hardeners are aliphatic polyamines specially synthesized to give the epoxies a wide range of curing speed, viscosity, and pot life. These hardeners may be used alone or in combination with other hardeners to produce specific end-properties in the C-8 resins.

Products made of these materials are claimed to be strong, lightweight, and characterized by excellent chemical resistance and electrical properties. The formulated compounds cure to hard solids at low or room temperature without applied pressure and with extremely low shrinkage, the company states. Further, these epoxies have excellent wetting ability, which makes possible their combination with many types of inert fillers. Equipped with a strong adhesive strength, the epoxies are capable of forming strong bonds with most metals, ceramics, glass, plastics, and hard rubber, according to Bakelite. The rapid setting qualities of the compounds, plus the fact that no by-product is formed during the hardening, recommend their use on production-line operations.

The C-8 resins are described as pale amber, thermosetting liquids with 100% reactive components when formulated with their hardeners. Specifications for the epoxies and for the hardeners are given as follows:

	Resins		Hardeners			
	BR-18774	BR-18795	BR-18793	BRR-18807	BRR-18803	BRR-18812
Specific gravity	1.12–1.14	1.12–1.14	1.06–1.09	—	1.02–1.03	0.996–0.975
Viscosity, centipoises	10,500–19,000	500–900	5,000–13,000	3,500–5,500	90–125	30–40
Assay:						
Epoxy, gram per gram-mole epoxy	179–194	170–182	—	—	—	—
Amine, %	—	—	49–52	—	43–47	15.5–16.6
Flash point (Cleveland open cup), °F., approx.	450	190	250	—	>85	270
Storage life at 77° F	1 yr.	1 yr.	—	—	—	—

Mixing of the resins with the hardeners produces compounds which have viscosities as indicated (in centipoises):

	Hardeners			
Resins	BR-18793	BRR-18807	BRR-18803	BRR-18812
BR-18774	4,000–6,000	6,500–7,500	50–400	100–800
18795	1,800–2,000	800–1,000	500–600	50–150

New Goods

Howard N. Hawkes, Vice President and General Manager of Tire Division, Showing U. S. Rubber's New Royal 8 Tire

Non-Squealing Car Tire

U. S. ROYAL 8, a new automobile tire that reportedly gives 25% more mileage and eliminates squeals and hum, has been introduced by United States Rubber Co., Rockefeller Center, New York 20, N. Y. The extra mileage is the result of a new tread design which provides an improved distribution of the tread rubber, and the non-noise feature has been attained by reversing the usual tread design to put the narrowest rib at the outside edge, according to the company.

Specifically engineered for both tube and tubeless construction, the U. S. Royal 8 of the latter type may soon find its way on to 1955 car models as original equipment, U. S. Rubber states. Other claims made for the new product include: improved traction and braking; easy steering; improved riding comfort; and modern styling. Safety slots for skid resistance, and outer grooves for casting off small stones are added features that have been incorporated into the regular, non-premium tire.

Intermediate Cross-Section Bike Tire

A bicycle tire that fits all standard balloon rims, but which has a cross-section intermediate between that of a balloon and a lightweight tire, also has been developed by U. S. Rubber. Called the U. S. Royal Middleweight, the new product is claimed to combine the speed and pedaling ease of the lightweight tires with the cushioning comfort of the balloon models.

Available in sizes to fit 20-, 24-, and 26-inch (diameter) wheels, the new tires have a cross-section of 1.75 inches. They are designed as replacements for current balloon tires and will soon be standard equipment for some of the newer types of American bikes, according to the company.

The Middleweight is constructed with high-quality cotton fabric and a natural rubber tread having three smooth ribs and two ribs with gripping blocks. Matching Butyl rubber tubes can be obtained for use with either the black or white sidewall models.

Vinyl Finger Grip for Handles

A FINGER grip which fits on to handle bars of bicycles, golf carts, etc., is being manufactured by Hungerford Plastics Corp., Rockaway, N. J., for sale to manufacturers for use on their equipment. Capable of being furnished with the name of the equipment manufacturer (or his trade mark, insignia, etc.) molded on to the top surface, the "Change-O-Name" grip is available in eight colors for the 7/8-inch bar size. The company plans to produce the item in other bar sizes soon.

The new product is being sold exclusively by Ohio Rubber Co., Willoughby, O.

Teflon Fiber

EXPERIMENTAL quantities of Teflon tetrafluoroethylene fiber are being produced by E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., for evaluation strictly as a tool for industry since no textile apparel uses are seen now for the fiber.

Equipped with all of the chemical and mechanical properties of Teflon, the fiber is suggested for use in such applications as liquid-filtration fabrics, packing, gaskets, valve diaphragms, special conveyors and belting, electrical tapes, etc. It is being manufactured in 400-denier yarn with 60 filaments mounted on a one-pound cone; each filament is continuous.

In appearance, the fiber is tan to brown in color, but can be bleached white. Some of the filament yarn's properties are:

Specific gravity	2.3
Tensile strength,*† psi	42,700
Tenacity,* grams per denier	1.45
Elongation,* %, at break	21.2
Modulus of elasticity*	Low
Decomposition temperature, °F	750
Moisture absorption	Zero
Possible useful temperature range, °F	400–525

*Instron tests.
†Same wet or dry

Steam Hose

STYLE MH steam cleaner hose, an addition to the commercial line of steam hose of the Goodyear Tire & Rubber Co., Akron, O., was recently introduced by the company for use in auto laundries, maintenance shops, etc. The product is described as lightweight, flexible, easy to handle, and durable.

Available in sizes ½- and ¾-inch, the new hose is recommended for handling alkaline based cleaning solutions such as caustic soda at pressures up to 100 psi. It is not recommended for handling chlorinated solutions.

Welding Hose

Dubl-Flex Welding Hose, another addition to Goodyear's commercial line, has been announced as available to the welding industry. Designed to meet the demands for flexibility and handling in such products, the new hose is a molded, double-line unit with one line colored red for acetylene, and the other green for oxygen. Sizes of 3/16- and ¼-inch are made.

Flexsteel Air Hose

A mandrel-made hose, designed to combat abusive external conditions found generally in the mining and quarrying industries, also has been added to the commercial hose made by Goodyear. Called the Flexsteel air hose, the new product is reinforced with steel wire and constructed with a heat and oil resistant tube and an impact and abrasion resistant cover.

Tests conducted on the hose have demonstrated its ruggedness and durability, according to the company. To simulate the frequent passing of rubber and steel wheels over the product, sections under high working pressure were placed on steel plates, and a 3½-ton weight was dropped on them. It is claimed that the crushing effect of the weight did not impair the operating efficiency of the hose even though tested in excess of 5,000 such drop cycles.

Lightweight Rubber Raincoats

A NEW line of cool, lightweight rubber raincoats, designed for police wear, has been introduced by The B. F. Goodrich Co., Akron, O. Tailored to permit greater flexibility and ease of movement, the products are reported to weigh only 2¾ pounds, or half the weight of the standard police raincoats. They contain extra reinforcement under all fasteners and are riveted at all points of stress, it is added.

Kel-F Coated Silicone O-Rings

BACON INDUSTRIES, INC., Watertown, Mass., maker of silicone rubber O-rings, recently added to its line a Kel-F coated O-ring for use where resistance to aromatic, chlorinated, or other solvents that normally attack silicone rubber is required. No sacrifice in the low-temperature properties of the rubber is made, however, and the new product can still withstand temperatures from —120 to 390° F.

Editor's Book Table

BOOK REVIEWS

"The Vanderbilt Latex Handbook." Edited by George G. Winspear. Published by R. T. Vanderbilt Co., 230 Park Ave., New York 17, N. Y. Cloth 5½ by 8¼ inches, 333 pages.

The first Vanderbilt Rubber Handbook was published in 1919, and since then several editions have been issued which have been accepted and have become nearly as much used in the industry as have slide rules. Only 1¾ pages were given to "Concentrated Latex" in the 1932 edition; by 1942, 28 pages; the Handbook grew to 719 pages in 1948, of which 72 pages were given to the discussion of latex. R. T. Vanderbilt Co. now meets the needs of the large and still-growing division of rubber practice with an excellently written and illustrated handbook devoted wholly to latex.

Although Mr. Winspear states in the foreword that it is intended as a "source of information for the exclusive use of those engaged in the latex branch of the rubber industry," the subjects covered and the details included are so broad, so precisely written and illustrated that it is not improbable that dry rubber compounders will find much of interest and usefulness in the new Latex Handbook.

The Table of Contents is well arranged. Nineteen specialists in latex cooperated with the editor in the preparation of this handbook. Some books of this type deal only with data arranged in tabular form for ready reference. In this volume such are preceded by chapters which describe the fundamentals of latex practice. Chapter I outlines latex compounding briefly. Chapter II describes the several commercial latices which are available. Chapter III is quite naturally the *raison d'être* of the volume; namely, a discussion of Vanderbilt materials. Here, as in the preceding handbooks, the essential properties, compositions, and technical data of these materials are detailed with a a brief outline of the latices in which they may be used. How to use these materials follows in Chapter IV, in which the recipes are numerous. Chapter V enlarges on the subject with laboratory procedures for testing, photographs of apparatus, and an extended study of formulae and the resulting physical properties.

For the use of the analyst, Chapter VI develops chemical identification and analysis of latex products and compounding materials. Chapters VII and VIII cover factory processes and the manufacture of specific articles. Chapter IX discusses the latest theories of vulcanization and includes experimental plans for the study of latex compounding. Chapter X gathers together testing procedures and specifications of the American Society for Testing Materials and The Rubber Manufacturers Association specifications for latex foam.

There are then included technical data in tabular form for ready reference. The list of literature references is brief and good. The final 11 pages comprise the index.

"The Vanderbilt Latex Handbook" is notable and will be exceptionally useful in the hands of the technical men who specialize in this branch of the rubber industry.

WILLIAM C. GEER

[EDITOR'S NOTE: William C. Geer is a retired former vice president of The B. F. Goodrich Co. who was in charge of research and development for that company for many years. He currently conducts research in his Ithaca, N. Y., laboratory. Dr. Geer is well known for his many technical contributions and the honors awarded him during his long association with the rubber industry.]

"Organic Peroxides, Their Chemistry, Decomposition, and Role in Polymerization." Arthur V. Tobolsky and Robert B. Mesrobian. Interscience Publishers, Inc., 250 Fifth Ave., New York 1, N. Y. Cloth, 6 by 9 inches, 206 pages. Price, $5.75.

Intended for the technical worker interested in the catalysis of chain reactions, such as in vinyl polymerization, this volume presents a detailed explanation of the role of organic peroxides in such reactions. The subject matter is divided into three parts, the first of which deals with the classification, structure, and synthesis of organic peroxides. The physical-chemical aspects of the cleavages of the peroxide molecules, as presently understood, are discussed in the second section; while the concluding section gives a quantitative discussion of the role of peroxides in the initiation of homogeneous vinyl polymerizations.

Appendices cover the physical constants of selected peroxides; the explosive nature of peroxides; a list of commercially available organic peroxides; and a discussion of catalyst efficiency. Both author and subject indices are appended.

NEW PUBLICATIONS

Publications of E. I. du Pont de Nemours & Co., Wilmington, Del.

"Neoprene Notebook." No. 59. 8 pages. In addition to Part VI of the excellent series on "The Language of Rubber," this part covering resilience and heat build-up, this issue also contains articles on neoprene conveyor belts, neoprene cable jackets, bellow-type seals, etc. The Language article deals with test procedures, evaluation of resilience measurements, and resilience and heat build-up in neoprene.

"Neoprene Notebook." Index. 10 pages. This issue is an index to "Neoprene Notebooks" from No. 1 to No. 59.

"More Dollars from Neoprene." BL-254. 3 pages. The economics of using one type of neoprene over other types, and similar considerations, are presented.

"Introduction to the Processing of Hypalon." BL-255. 6 pages. Properties of the polymer are discussed, and recommended procedures for processing are given.

"Safe Processing Neoprene Type W Wire and Cable Compounds for CV Cure." BL-256. 3 pages. The method of processing such compounds with a system of acceleration consisting of a thiuram, a guanidine, NA-22, and sulfur for MgO-ZnO cured stocks, and a similar combination without NA-22 for red-lead cured stocks, are published here.

"Neoprene Type W as a Processing Aid in Neoprene Type GN Compounds." BL-257. 3 pages. The use of relatively small percentages of Type W to prevent mill and calender sticking, reduce softening during mixing, improve scorch resistance, and enhance certain properties of the vulcanizate is considered.

Publications of Dow Corning Corp., Midland, Mich., for inclusion in "Silastic Facts" Notebook:

"RTV Silastics S-5302 and S-5303." Reference 9-213. **"RTV Silastics S-5137A and 5138A."** Reference 9-214. 1 page each. These preliminary data sheets with the properties of the respective Silastics are intended for insertion in section #8 of the Notebook.

"Silastic Stocks and Typical Properties of Parts Fabricated of Silastic." Reference 9-334. 4 pages. This index to Silastic stocks is also intended for section #8 of the Notebook.

"Silastic 7-180; 160; 7-170; 152; and 6-125." 2 pages each. Respective references 9-337, -339 -340, -341, and -342 (superseding 9-320, -306, -302, -305, and -314, respectively). These publications, giving the properties and applications of the respective Silastic stocks, are for inclusion in section #8.

"How to Bond Silastic." Reference 9-209 (replacing 9-201). 6 pages.

"Qualification of Silastic for Various Silicone Rubber Specifications." Reference 9-210 (replacing 9-207). 2 pages. These last two publications, to be included in the Notebook section designated "Technical Data," cover the material indicated in their respective titles.

"Silastic Newsletter." Vol. II, No. 2, May-June, 1954. 6 pages. Articles on selecting low compression set Silastic compounds, on Silastic paste for calking and insulating railroad traction motors, on Silastic 80 as an insulating covering for electrical wire and cable, on the resistance of Silastic 50 and 80 to cooking oils, and on new special-purpose Silastic stocks are contained in this issue.

"Silicone News." No. 6. 2 pages. Various applications of the company's silicone rubbers are described in this newsletter.

Publications of Monsanto Chemical Co., St. Louis, Mo.:

"Industrial Applications for Santocel." 10 pages. The suggested uses for this silica aerogel (90% SiO_2), described as a chemically inert, heat stable, insoluble, free-flowing product, together with its physical properties and specifications, are given here.

"Organic Syntheses Based on Acrylonitrile." This 44- by 34-inch wall chart presents in sequential form the methods for the synthesis of acrylonitrile compounds according to three general classifications: cyanoethylation reactions, nitrile reactions, and olefinic reactions.

"Rubber Grade Carbon Blacks at a Glance." United Carbon Co., Inc., Charleston, W. Va. 1 page. This colored chart gives the trade names of the various types of blacks available from the nine major suppliers of the material.

"Hobbs Slitter and Rewinder." Hobbs Mfg. Co., Worcester, Mass. 4 pages. This revised illustrated folder on the improved machines (formerly known as Jacques units) covers the operations capable of being performed by this machine.

Publications of the Office of Synthetic Rubber, Reconstruction Finance Corp., Washington 25, D. C., for inclusion in Sales Catalog "GR-S & GR-I Synthetic Rubbers."

"Table A—Hot GR-S Polymers." 5-1-54. **"Table C—Cold GR-S Polymers."** 3-1-54 **"Table D—Cold GR-S Black Masterbatch Polymers."** 3-1-54. **"Table E—Cold Oil Masterbatch Polymers."** 5-1-54. **"Table G—Hot GR-S Latices."** 5-1-54. 1 page each. These revised tables reflect changes effected over the past few months in designation and specifications for the rubbbers.

"GR-S 1502, 1503, and 1504." 3-1-54. 2 pages each. The specifications for these respective cold GR-S polymers are herein contained.

"GR-S 1601 and 1602." 3-1-54. 2 pages each. The specifications for these cold GR-S black materbatch polymers, are given. GR-S 1602 is the new designation for the experimental masterbatch X-733.

NOTE: GR-S 1704 has been discontinued.

"Specifications for GR-S 1501." 6-15-54. 1 page. For inclusion in "Specifications for Government Synthetic Rubbers—Revised Edition—October 1, 1952."

Note: Production of GR-S 1704 has been discontinued, and the specification for this polymer should be removed from the catalog.

Publications of the Bakelite Co., New York, N. Y.:

"Bakelite Fluorothene Resins—Properties, Forms, Fabrications." Technical Data, April, 1954. 16 pages. The latest information about these resins, plus recommendations on extrusion, injection, and compression molding of the plastics, are presenttd in graphs, tables, and text in this brochure.

"Bakelite Vinyl Rigid Sheets." Technical Data, February, 1954. 40 pages. The forms, properties, fabrication techniques, and applications of the plastic sheets, including laboratory test data in graphs and tables, are presented in this booklet.

"Annual Report on the Progress of Rubber Technology. Vol. XVII, 1953." Edited by T. J. Drakeley. Published by W. Heffer & Sons, Ltd., Cambridge, England, for the Institution of the Rubber Industry, 12 Whitehall, London, S.W.1, England. Cloth, 7½ by 9¾ inches, 185 pages. Price, 1/1/0. This annual review, differing from that for 1952 in that it covers only 11 months, presents articles on the various industries by specialists in their respective fields. Subjects covered include: planting and production of raw rubber, latex, gutta percha, and other related products; properties, applications, and utilization of latex; chemistry and physics for raw rubber; synthetic rubber; testing and equipment and specifications other than for latex; compounding ingredients; fibers and fabrics; chemistry and physics of vulcanized rubber; tires; belting; hose and tubing; cable and electrical insulation; footwear; mechanical rubber goods; games, sport accessories, toys, etc.; surgical goods; textile-rubber composites, solvents, cements; cellular rubber; hard rubber; flooring; works processes and materials; machinery and appliances; and roads. Also included are a historical and statistical review of the happenings in the rubber world during the period, and name and subject indices.

Of special interest is coverage, within the synthetic rubber article, of condensation rubbers of the ester-isocyanate (polyester) type, such as Chemigum SL and Vulcollan. The background of this type of rubber is considered, and recently discovered reactions and processing problems are discussed.

"Hycar Technical Newsletter." Vol. 3, No. 5. B. F. Goodrich Chemical Co., Rose Bldg., Cleveland 15, O. 6 pages. Articles entitled, "Compounding of Hycar 1042 for Low-Temperature Flexibility" and "Advantages of Good-rite GP-261 over Dibutyl Phthalate" are contained in this issue of the *Newsletter*.

"Goodyear Engineering Data for Multiple V-Belts." Goodyear Tire & Rubber Co., Akron, O. 36 pages. Standard sizes and pitch lengths of V-belts, groove dimensions for sheaves, horsepower rating tables, and an explanation of the fundamentals of V-belt design are among the subjects covered by this brochure.

"'Nadic' Anhydride." Technical Bulletin I-5. Allied Chemical & Dye Corp., New York, N. Y. 12 pages. Physical properties, chemical reactions, and suggested use in polyesters, organic coatings, resins, rubber, plasticizers, etc., of 3,6-endomethylene-Δ4-tetrahydrophthalic anhydride are presented here.

"Plant Maintenance Cleaning Guide." Oakite Products, Inc., New York, N. Y. 12 pages.

"Equipment for the Plastics Industry." Stewart Bolling & Co., Inc., Cleveland 27, O. 8 pages. Specifications, descriptions, and photographs of the company's Spiral-Flow intensive mixers, interchangeable intensive mixer chambers, laboratory and production roll mills, compression and transfer presses, and three- and four-roll calenders are given in this publication.

"Indonex Plasticizers in Hard Rubber Compounds." Circular 13-49. Indoil Chemical Co., 910 S. Michigan Ave., Chicago 80, Ill. 4 pages. The properties of hard rubber products containing the company's plasticizers, along with the specifications for these plasticizers, are published in this bulletin.

"Methanol." Bulletin F-8141. Carbide & Carbon Chemicals Co., New York 17, N. Y. 14 pages. The physical properties and specifications for this chemical are presented, some in graphical form, in this publication.

"B. F. Goodrich Light Conveyor Belts." No. 2640. The B. F. Goodrich Co., Akron, O. 4 pages. This catalog insert features information on the new Koroseal conveyor belts recommended for food handling applications, and on the company's "Highseal" and "Kleenseal" rubber conveyor belts that are colored green to ease eye strain.

"Delayed Action Accelerators: NOBS No. 1 and NOBS Special." Rubber Chemicals Technical Bulletin No. 836. American Cyanamid Co., Bound Brook, N. J. 40 pages. The chemical and physical properties of these accelerators and illustrations of their activity in natural and synthetic rubbers with various types and amounts of carbon black are contained in this bulletin.

"Manhattan Moldiscs for Portable Grinders." Bulletin No. 6901-E. Raybestos-Manhattan, Inc., Passaic, N. J. 4 pages. This illustrated booklet covers sizes, grades, and recommended operating speeds; application data and photographs; and the advantages claimed for the safety wheel.

"Proportioning Carbon Black in Rubber Manufacturing." Technical Bulletin 53A. Richardson Scale Co., Clifton, N. J. 2 pages. Described and illustrated in this catalog insert-type publication is a remote-controlled system for proportioning carbon blacks in rubber compounding operations.

"Tumb-L-Matic Controlled Low-Temperature Insulated Tumbling Barrel." Tumb-L-Matic, Inc., New York, N. Y. 1 page. This data sheet covers the specifications for the company's liquid carbon dioxide-cooled, thermostatically controlled barrel for use in deflashing rubber articles.

"dbpc Antioxidant (Di-tert-Butyl-para-Cresol)." Technical Bulletin C-4-115. Koppers Co., Inc., Pittsburgh 19, Pa. 16 pages. Toxicological information, descriptions of chemical reactions, and commercial information on this product are available in this brochure. Included in its applications are those as a non-staining rubber antioxidant and as a stabilizer for several plastics resins.

"The Magic Wand Electrostatic Neutralizer." Herman H. Sticht Co., Inc., New York, N. Y. 4 pages. A description of the neutralizer bars and their function is contained in this bulletin.

"Directory of the Division of Rubber Chemistry, American Chemical Society." April 15, 1954. 46 pages. This is an authorized listing of the members and associates of the Division, plus the by-laws of the organization.

"Acrylonitrile." Technical Bulletin F-8381. Carbide & Carbon Chemicals Co., 30 E. 42nd St., New York 17, N. Y. 8 pages. The reactions, properties, constant-boiling mixtures, specifications, shipping data, and major uses of this chemical are given in this booklet.

"Diisodecyl Adipate." Technical Bulletin No. 0.113. Monsanto Chemical Co., St. Louis, Mo. 8 pages. The physical and chemical specifications of DIDA, a low-temperature plasticizer for vinyl resins, and the properties of vinyl products into which it has been formulated, are given in this bulletin.

"Palco Industrial Chemicals: Palcotan, Palconate." Bulletin No. C-130-1. Pacific Lumber Co., San Francisco, Calif. 6 pages. The chemical and physical properties of these materials, identified as the sodium salts of sulfonated organic acids and of organic acids, respectively, and suggested for use as dispersing agents, are contained in this brochure.

"Automatic Hopper Scale with Indication and Recording." Technical Reference No. 53H. Richardson Scale Co., Clifton, N. J. 2 pages. Indicating and recording systems for use with hopper scales, including information on switches, printing, etc., are described in this catalog insert.

"Manhattan Rubber Bonded Centerless Wheels." Bulletin No. 6925. Raybestos-Manhattan, Inc., Passaic, N. J. 4 pages.

BIBLIOGRAPHY

A Vinyl Chloride Polymerization Procedure. S. G. Bankoff, R. N. Shreve, *Ind. Eng. Chem.*, Feb., 1953, p. 270.

Suspension Polymerization of Styrene. W. S. Kaghan, R. N. Shreve, *Ind. Eng. Chem.*, Feb., 1953, p. 292.

Reactions of Vinyltrichlorosilane and Vinyltriethoxysilane. G. H. Wagner, D. L. Bailey, A. N. Pines, M. L. Dunham, D. B. McIntire, *Ind. Eng. Chem.*, Feb., 1953, p. 367.

Biological Deterioration of Polysulfide Polymers Employed as Linings for Gasoline Storage Tanks. F. H. Allen, D. Fore, Jr., *Ind. Eng. Chem.*, Feb., 1953, p. 374.

Influence of Carbon Black on the Oxidation of Natural Rubber. G. J. van Amerongen, *Ind. Eng. Chem.*, Feb., 1953, p. 377.

Aids in Vulcanization of Lignin-Natural Rubber Coprecipitates. T. R. Griffith, D. W. MacGregor, *Ind. Eng. Chem.*, Feb., 1953, p. 380.

Products of Oxidation of an Olefin Structurally Related to GR-S. G. R. Mitchell, J. R. Shelton, *Ind. Eng. Chem.*, Feb., 1953, p. 386.

Effect of Oxygen Concentration on Aging of Rubber Vulcanizates. J. R. Shelton, W. L. Cox, *Ind. Eng. Chem.*, Feb., 1953, p. 392.

Studies on the Yellow Fraction of Latex. G. E. van Gils, *Ind. Eng. Chem.*, Feb., 1953, p. 452.

Vibration Characteristics of Tread Stocks. K. E. Gui, C. S. Wilkinson, Jr., S. D. Gehman, *Rubber Chem. Tech.*, Oct.-Dec., 1952, p. 711.

Temperature Dependence of Dynamic Properties of Elastomers. J. D. Ferry, E. R. Fitzgerald, L. D. Grandine, Jr., M. L. Williams, *Rubber Chem. Tech.*, Oct.-Dec., 1952, p. 720.

Obtaining Coumarone Resin and Similar Products during the Refining of Cyclic Hydrocarbons. H. Anders, *Kunststoffe*, 42, 11, 403 (1952).

Thermal Degradation of Macromolecular Compounds. H. Hopff, *Kunststoffe*, 42, 12, 423 (1952).

Some Problems in Connection with the Testing of Plastics. R. Nitsche, *Kunststoffe*, 42, 12, 427 (1952).

Relation between Macromolecular Structure and Mechanical Properties under Deformation. A. V. Blom, *Kunststoffe*, 42, 12, 433 (1952).

Viscosity of High Polymers and Polyelectrolytes. A. Peterlin, *Kunststoffe*, 42, 12, 437 (1952).

Softening of Macromolecular Substances. F. Wurstlin, H. Klein, *Kunststoffe*, 42, 12, 445 (1952).

Light Materials (Foamed Materials) and Their Application. P. Hoppe, *Kunststoffe*, 42, 12, 450 (1952).

Effects of Method of Processing on Strength as Shown on Transfer Molded Parts. W. Woeboken, *Kunststoffe*, 42, 12, 460 (1952).

Reinforcement of Rubbers. R. Houwink, *Rev. gén. caoutchouc*, 29, 5, 346 (1952).

Recent Advances in the Manufacture of Foam Rubber. R. Hublin, *Rev. gén. caoutchouc*, 29, 5, 354 (1952).

Copper and the Nutrition of *Hevea brasiliensis*. P. Tixier, *Rev. gén. caoutchouc*, 29, 5, 358 (1952).

Chemical Study of Accelerators of Rubber Plasticization. M. Montu, *Rev. gén. caoutchouc*, 29, 7, 506 (1952).

Problems Arising in the Preparation of Compounds. E. Stalinsky, *Rev. gén. caoutchouc*, 29, 7, 510 (1952).

Dielectric Study of Polar and Non-polar Rubbers Loaded with Carbon Black. R. Dalbert, *Rev. gén. caoutchouc*, 29, 7, 515; 8, 588; 9, 649 (1952).

Use of Fillers in Heat Sensitive Latex. R. Belmas, *Rev. gén. caoutchouc*, 29, 8, 578 (1952); 30, 1, 39 (1953).

CLASSIFIED ADVERTISEMENTS

ALL CLASSIFIED ADVERTISING MUST BE PAID IN ADVANCE

Effective July 1, 1947

GENERAL RATES

Light face type $1.25 per line (ten words)
Bold face type $1.60 per line (eight words)
Allow nine words for keyed address.

SITUATIONS WANTED RATES

Light face type 40c per line (ten words)
Bold face type 55c per line (eight words)

SITUATIONS OPEN RATES

Light face type $1.00 per line (ten words)
Bold face type $1.40 per line (eight words)

Letter replies forwarded without charge, but no packages or samples.

Address All Replies to New York Office at 386 Fourth Avenue, New York 16, N. Y.

SITUATIONS OPEN

RUBBER CHEMISTS

Requirements: Degree in Chemistry or Chemical Engineering. Up to 5 years' experience in rubber compounding development or production.

Advantages: Well equipped laboratory, progressive company, Eastern location, contacts with customer, sales and manufacturing departments.

Write giving age, experience and education. Replies held confidential. Employees know of this ad.

ADDRESS BOX NO. 1502, C/O India RUBBER WORLD

RUBBER CHEMIST—MINIMUM B. S. AND 3 YEARS' EXPERIence required for research and development in compounding with an established and progressive resin manufacturer in Western Pennsylvania supplying the rubber trade. Occasional service calls. Send personal data, details of experience, and recent photograph. Address Box No. 1524, care of RUBBER WORLD.

SALES AND TECHNICAL SERVICE: LATEX, ADHESIVES, AND Coatings. Progressive young company. Excellent opportunity for right men. Territories open Detroit, Chicago, St. Louis, San Francisco, and Atlanta. Address Box No. 1525, care of RUBBER WORLD.

LATEX RESIN COMPOUND SALES MANAGER: ADHESIVES, solvent cements, dip, casting, cap and can sealing, plastisols, backings, etc. Excellent opportunity, progressive company. Address Box No. 1526, care of RUBBER WORLD.

TIRE COMPOUNDER

Large tire manufacturer in New England is looking for a man well founded in development and factory compounding, chiefly in the field of tires. He will be expected primarily to handle product development work on tires and tubes. Write giving age, experience, education, and salary expected. Address Box No. 1527, care of RUBBER WORLD.

LATEX CHEMIST

Excellent opportunity for development chemist experienced in developing Natural and Synthetic Latex Compounds. New England area. State age, education, and experience. Address Box No. 1528, care of RUBBER WORLD.

SITUATIONS WANTED

SALES OR SALES SERVICE IN LATEX COMPOUNDING MATERials. Have had twenty-five years' experience in latex compounding, development, and sales service. Believe fully qualified to promote raw material sales. New England area. Address Box No. 1521, care of RUBBER WORLD.

ASPHALT—RUBBER. CHEMICAL ENGINEER, B.S. DEGREE, SPEcialist in asphalts, polymers, with extensive asphalt manufacturing, paving, and roofing experience, seeks supervisory position in development, manufacturing, uses of new polymers in asphalts; latest methods; good coordinator. Would consider consulting. Address Box No. 1522, care of RUBBER WORLD.

LATEX CHEMIST FOR THIRTEEN YEARS. LATEX AND COAGUlant formula design. Factory supervision. Trouble-shooting. Familiar with dry rubber technique and plastisol. New Jersey—New York area. Willing to relocate. Address Box No. 1523, care of RUBBER WORLD.

MACHINERY & SUPPLIES WANTED

WANTED: PLANT OR MACHINERY INCL. RUBBER MILLS, Calenders, Mixers, Banbury Mixers, Extruders, Grinders, Cutters, Hydraulic Presses, Injection Molding Machines. CONSOLIDATED PRODUCTS CO., INC., 64 Bloomfield Street, Hoboken, N. J. BArclay 7-0600.

WANTED TO BUY: YERZLEY OSCILLOGRAPH, USED, IN GOOD condition. State price. Address Box No. 1530, care of RUBBER WORLD.

WANTED: BANBURY MIXER BODIES AND PARTS, ANY SIZE. WRITE INTERSTATE WELDING SERVICE, Offices, Metropolitan Building, Akron 8, Ohio.

MISCELLANEOUS

WANTED TO BUY: *RUBBER CHEMISTRY AND TECHNOLOGY.* Complete or nearly complete sets back to 1940 or earlier. State price. Address Box No. 1531, care of RUBBER WORLD.

MACHINERY AND SUPPLIES FOR SALE

FOR SALE: FARREL 16" X 48" and 15" X 36", 2-ROLL RUBBER mills, and other sizes up to 84". Also new and used lab. 6" x 12" x 6" x 16" mixing mills and calenders. Six American Tool 300-gallon Churns. Extruders 1" to 6". Baker-Perkins Jacketed Mixers 100, 50, and 9 gals., heavy-duty double-arm. 350-ton upstroke Hydr. Press 22" x 24" platens. 325-ton upstroke 42" x 24" platens. Brunswick 200-ton 21" x 21" platens. Large stock of hydraulic presses from 12" x 12" to 48" x 48" platens from 50 to 2,000 tons. Hydraulic Pumps and Accumulators. Rotary Cutters. Stokes Automatic Molding Presses. Single Punch & Rotary Preform Machines, Banbury Mixers, Crushers, Churns, Rubber Bale Cutters, etc. SEND FOR SPECIAL BULLETIN. WE BUY YOUR SURPLUS MACHINERY. STEIN EQUIPMENT CO., 107—8th St., Brooklyn 15, N. Y. STerling 8-1944.

W & P 100-GAL. DUUBLE-ARM JACKETED MIXER, SIGMA blades; B-P #14 JEM 50-gal., 50 H.P. double-arm jacketed vacuum Mixer, sigma blades. Kux model 25 Rotary Pellet Presses, 21 and 25 punch. Large stock steel and stainless steel kettles and tanks. PERRY EQUIPMENT CORP., 1424 N. 6th St., Phila. 22, Pa.

MARKET REVIEWS

RUBBER

Both the physical and futures rubber markets rose slightly over the period from May 16 to June 15, and daily fluctuations in prices were not striking. The spot market prices rose almost 3¢ in some cases, with all grades rising at least 1¢ a pound. On the futures market, prices rose less than 1¢ for all months.

The fluctuations that did occur over the period could be traced to the daily reports from Indo-China and Geneva. Toward the end of the period the volume of futures traded lessened as foreign dealers held up offerings while watching the current political conference.

NEW YORK SPOT MARKET
WEEK-END CLOSING PRICES

	Mar. 27	Apr. 24	May 22	May 29	June 5	June 12
R. S. S.: #1.	20.50	22.25	22.50	22.63	22.75	23.38
2	20.25	21.88	22.25	22.28	22.63	23.25
3	20.13	21.38	22.13	22.25	22.50	23.13
Latex Crepe						
#1 Thick	24.50	25.50	28.00	28.63	29.00	30.25
Thin	23.25	24.88	25.88	25.75	25.75	26.25
#3 Amber						
Blankets	18.88	20.75	21.25	21.75	22.00	22.88
Thin Brown Crepe	17.63	19.38	20.25	20.75	21.00	21.75
Flat Bark	15.25	16.25	16.63	17.00	17.13	18.25

Ribbed Smoked Sheets started the period at a low of 22.25¢ and rose at a fairly steady rate to a high of 23.50¢ on May 14, then dropped to 23.25¢ to close. These price movements were closely paralleled by the other grades, except that some stocks did not have the falling off at the end of the period. May monthly average spot prices for certain grades are as follows: R.S.S. #1, 22.33¢; R.S.S. #3, 21.95¢; #3 Amber Blankets, 21.31¢; and Flat Bark, 16.74¢.

COMMODITY EXCHANGE
WEEK-END CLOSING PRICES

Futures	Mar. 27	Apr. 24	May 22	May 29	June 5	June 12
Sept.	20.30	22.45	22.85	23.00	23.00	23.70
Dec.	20.39	22.90	23.30	23.40	23.20	23.92
Mar. 1955	20.49	22.85	23.40	23.45	23.35	24.10
May	20.50	22.85	23.40	23.50	23.40	24.30
July	—	—	23.40	23.50	23.40	24.40
Total weekly sales, tons	3,570	7,950	2,600	2,660	1,390	4,440

September futures started the period at 22.75¢, dropped to a low of 22.40¢ on May 25, rose to a high of 23.90¢ on June 10, and then gradually dropped to a closing price of 23.55¢.

Sales during the second half of May amounted to 5,260 tons, making a monthly total of 14,430 tons. Sales during the first half of June totaled 5,830 tons.

Latex

Long-term contracts covering the remainder of this year and in some cases well into 1955 were entered into by large consumers during the period from May 16 to June 15. Purpose of these agreements, according to some observers, is to insure supply of concentrated latex at present differential levels. Such levels have advanced during the period, and concern over the possible interruption of the natural product tends to indicate even further advancements.

Some quarters attribute the present increase to the belief that a scarcity of latex will exist next year. Large differentials in price usually stimulate production, but on the other hand, competition many times causes additional increases in the differentials.

Prices for centrifuged latex ranged from 30½ to 32½¢ a pound (dry solids) from Far Eastern sources.

Final March and preliminary April domestic statistics for natural and synthetic rubber latices follow:

(All Figures in Long Tons, Dry Weight)

	Production	Imports	Consumption	Month-End Stocks
Natural latices				
Mar.	0	5,682	6,610	11,870
Apr.	0	5,003	6,073	10,787
GR-S latices				
Mar.	4,132	10	3,982	5,247
Apr.	4,046	0	3,717	5,359
Neoprene latices				
Mar.	709	0	729	975
Apr.	803	0	513	1,045
Nitrile latices				
Mar.	483	0	335	588
Apr.	461	0	298	580

RECLAIMED RUBBER

Only fair activity was reported in the reclaim market during the first part of the period from May 16 to June 15; while the second half indicated a strong trend toward increased consumption. It is believed that, if the trend continues, June totals will be considerably higher than those of May.

Final March and preliminary April statistics on the domestic reclaim industry are available. March figures, in long tons, were: production, 23,305; imports, 78; consumption, 22,882; exports, 830; and month-end stocks, 32,148. Preliminary data for April, also in long tons, were: production, 21,612; imports, 100; consumption, 21,762; exports, 886; and month-end stocks, 31,796.

There were no changes in reclaimed rubber prices during the period, and current prices follow:

Reclaimed Rubber Prices

	Lb.
Whole tire: first line	$0.10
Fourth line	.0875
Inner tube: black	.15
Red	.21
Butyl	.125
Pure gum, light colored	.23
Mechanical, light colored	.135

The above list includes those items or classes only that determine the price basis of all derivative reclaim grades. Every manufacturer produces a variety of special reclaims in each general group separately featuring characteristic properties of quality, workability, and gravity at special prices.

SCRAP RUBBER

Activity in the scrap rubber markets was very limited during the major part of the May 16-June 15 period, with the only activity occurring in mixed tires toward the period's end. Some demand for tubes was also noted.

Mixed tire prices dropped slightly in the Akron area where $11.50 a ton was being asked (as compared to $12.00 per ton last month). Some passenger car tubes, on the other hand, rose as much as 0.25¢ a pound in both areas.

The following are dealers' selling prices for scrap rubber, in carload lots, delivered to mills at the points indicated:

	Eastern Points	Akron, O.
	(Per Net Ton)	
Mixed auto tires	$9.00	$11.50
S. A. G. auto tires	Nom.	13.00
Truck tires	Nom.	14.00
Peelings, No. 1	40.00/41.00	40.00/42.00
2	Nom.	Nom.
3	15.50	Nom.
Tire buffing	18.00/20.00	16.00/17.00
	(¢ per Lb.)	
Auto tubes, mixed	2.75	3.00
Black	4.50	4.75
Red	7.50	8.00
Butyl	1.75	2.13

RAYON

Shipments of rayon by domestic producers during May totaled 92,000,000 pounds, or about 1½% above the April shipments, but 16% lower than those of May, 1953. Total production in May amounted to 90,100,000 pounds, or almost 6% above April's production figure. Month-end stocks were placed at 96,200,000 pounds, or a little less than 2% below the April level.

Viscose high-tenacity rayon yarn figures for May were as follows: calculated production, 28,300,000 pounds (about 2½% above April's total); total shipments, 27,000,000 pounds (10% below April's shipments); and end-of-month stocks, 13,600,000 pounds (7% above the April figure).

World production of viscose high-tenacity yarn in 1953 amounted to 679 million pounds as compared to 593 million pounds for 1952. World capacity for 1954 has been placed at 831 million pounds, with an increase in capacity to 875 million pounds anticipated for 1955.

No changes were made in rayon tire yarn and fabric prices during the period from May 16 to June 15, and current prices follow:

Rayon Prices

Tire Yarns		
1100/ 480	$0.26	$0.63
1100/ 490		.62
1150/ 490		.62
1165/ 480		.63
1650/ 720		.61
1650/ 980		.61
1820/ 980		.61
2200/ 960		.60
2200/ 980		.60
2200/1466		.67
4400/2934		.63
Tire Fabrics		
1100/490/2		.72
1650/980/2	.659	.73
2200/980/2		.685

COTTON FABRICS

Periodic demands for most industrial cotton fabrics characterized the trading period from May 16 to June 15 although a generally limited volume of business was transacted. Heavy drills and hose and belting

CLASSIFIED ADVERTISEMENTS

Continued

MACHINERY AND SUPPLIES FOR SALE (Continued)

FOR SALE: 1—HORIZONTAL VULCANIZER, 6' DIA. X 10' LONG, with track & carriage. Simplex quick-opening door. Address Box No. 1529, care of RUBBER WORLD.

BREWSTER MACHINE CO.
New and Rebuilt Rubber Mill Machinery
Write or call JIM BROWN
349 E. Exchange St., Akron 4, Ohio, FR 6-2911

FOR SALE: 3 RUBBER MILLS, 10" X 16", 10" X 20", 12" X 24"; 1—20" x 16" 2-opening hydraulic press, 14" ram; 1—6' x 12' vulcanizer, O.O. door. Also Banbury mixers, extruders, calenders, cutters, etc. CHEMICAL & PROCESS MACHINERY CORP., 148 Grand Street, New York 13, N. Y.

The Classified Ad Columns of RUBBER WORLD bring prompt results at low cost.

BUYING-SELLING All kinds of *used* machinery for the Rubber and Allied Industries.

OFFERING NEW MACHINERY Hydraulic Presses, Laboratory Mills and Presses, Sponge Rubber Vulcanizing Presses, Drilled Steel Steam Platens, Rubber Bale Cutters guillotine type, Vulcanizers with quick opening doors, etc.

HIGH EFFICIENCY IN QUALITY, PRICE AND DELIVERY TIME

ERIC BONWITT 431 S. Dearborn Street Chicago 5, Ill.

GOOD USED MACHINERY

WANTED YOUR IDLE EQUIPMENT

1—F.B.32"x92" inverted-L 4-roll Calender, reduction drive, D.C. varispeed motor.
1—Adamson 5'x28' Vulcanizer, quick-opening door, A.S.M.E.; 1—5'x12' quick-opening door, 125 psi.
1—Royle #4 Extruder, motor driven.
1—6"x12" Laboratory Mill, m.d.
1—Ball & Jewell #2 Rotary Cutter, 15 HP Motor.
3—#28 Devine Vac. Shelf Dryers, 19-59"x78" shelves, complete.
1—Farrel Birmingham 6"x13" 3-roll Calender.
4—Hymac 150-ton 18"x18" Hydraulic Presses, electrically heated platens, 9" diameter rams.
1—Read 2000# all steel Horizontal Mixer outboard bearings.
1—Farrel 20"x22"x60" Mill, top cap frame, Falk reduction drive, 100 HP motor.
2—Farrel 16"x42" Mills with reduction drive and 100 HP Motor.
Also other sizes Hydraulic Presses, Tubers, Banbury Mixers, Mills, Vulcanizers, Calenders, Pellet Presses, Cutters.

PHONE—WIRE—WRITE • *Send us your inquiries*

Consolidated Products Company, Inc.

64 Bloomfield St., Hoboken, N. J.
N.Y. Tel.: BArclay 7-0600 HOboken 3-4425
"Our 37th Year" Cable Address: Equipment Hoboken, N.J.

USED MACHINERY FOR SALE

1—Ambaco Model 3A Continuous Baler.
2—Thropp 2-roll Rubber Mills, 18"x50".
1—6' x 14' Vulcanizer, 90 psi. ASME.
1—Adamson Vulcanizer, 2' x 12' with quick opening door.
1—J. P. Devine Double Door Vacuum Shelf Dryer, 13 Shelves.
1—Paul O. Abbe #2 Master Rotary Cutter with Ball Bearings.
1—Welding Engr. Stainless Steel #2 Extruder.
14—Baker Perkins Steel Jacketed Mixers—100 gals.—Type 15 JIM 2. Late type construction.
10—Buflovak Single Door Vacuum Shelf Dryers, 20 Shelves.
1—Spadone Rubber Bale Cutter with 29" Knife.

WE ARE INTERESTED IN PURCHASING ALL TYPES OF RUBBER machinery consisting of mills, Banbury mixers, extruders, calenders, vulcanizers, etc. and also complete plants.

R. GELB & SONS Inc.
STATE HIGHWAY No. 29, UNION, N.J.
UNIONVILLE-2-4900

Economical **NEW** Efficient

Mills - Spreaders - Churns
Mixers - Hydraulic Presses
Calenders

...GUARANTEED...

Rebuilt Machinery for Rubber and Plastics

LAWRENCE N. BARRY
41 Locust Street Medford, Mass.

They'll--
QUICKLY PAY FOR THEMSELVES
--in your plant

- HOLMES ROTARY STOCK CUTTER
- HOLMES HYDRAULIC PRESSES
- HOLMES CRUDE RUBBER BALE CUTTER
- HOLMES HYDRAULIC PUMPING UNIT
- HOLMES SPONGE RUBBER VULCANIZING PRESS

Write for Details

Stanley H. HOLMES Company
Since 1901
3300 WEST LAKE STREET • CHICAGO 12, ILLINOIS

NEW and REBUILT MACHINERY

Since 1891

L. ALBERT & SON

Trenton, N. J., Akron, Ohio, Chicago, Ill., Los Angeles, Calif.

GUARANTEED REBUILT MACHINERY

IMMEDIATE DELIVERIES FROM STOCK

MILLS, CALENDERS, TUBERS
VULCANIZERS, ACCUMULATORS

UNITED

HYD. PRESSES, PUMPS, MIXERS
CUTTING MACHINES, PULVERIZERS

UNITED RUBBER MACHINERY EXCHANGE
183-189 ORATON ST. CABLE "URME" NEWARK 4, N. J.

ducks were among the active fabrics, and a fair volume of special constructions of sheetings and osnaburgs for tape use was sold toward the end of the period.

Sheetings and osnaburgs have been in good demand lately, causing some mills to consider putting additional looms on these fabrics, and although overall production of cotton fabrics for heavy box tapes has been reduced substantially in recent years, leading producers of sheetings and osnaburgs for tape use are now estimated to be manufacturing about 50% of the volume of these fabrics they produced several years ago.

The somewhat firmer tone of the fabric market in general, which was recognizable at the end of the last period, continues during the current period. Observers believe that requirements are still substantial and that much buying remains to be done, despite the recent general inactivity which saw a relatively limited volume of second-hand offerings and the curtailment of production of many types of gray cloth.

The following are selling prices, f.o.b. shipping point, at the end of the period:

Cotton Fabrics

Drills		
59-inch 1.85-yd.	yd.	$0.35
2.25-yd.		.30
Osnaburgs		
40-inch 2.11-yd.	yd.	.24
3.65-yd.		.15
Ducks		
38-inch 1.78-yd. S. F.	yd.	Nom.
2.00-yd. D. F.		.30⅝
51.5-inch, 1.35-yd. S. F.		.46⅝
Hose and belting		.64
Raincoat Fabrics		
Printcloth, 38½-inch, 64x60	yd.	.135
Sheeting, 48-inch, 4.17-yd.		.20
52-inch, 3.85-yd.		.21 / .2125
Chafer Fabrics		
14.30-oz./sq. yd. Pl.	lb.	.71
11.65-oz./sq. yd. S.		.63
10.80-oz./sq. yd. S.		.6675
8.9-oz./sq. yd. S.		.68
Other Fabrics		
Headlining, 59-inch, 1.65-yd., 2-ply	yd.	.465 / .4675
64-inch, 1.25-yd., 2-ply		.60
Sateens, 53-inch, 1.32-yd.		.54
58-inch, 1.21-yd.		.59

News about People

(Continued from page 542)

Ed Merriman has been named production superintendent, and **Hugh Ellis** has been appointed director of advertising and public relations of the Dismuke Tire & Rubber Co., Clarksdale, Miss. Mr. Merriman has been with Dismuke since its founding in 1948 and has held the positions of scheduler, chief of the shipping department, and warehouse manager. Mr. Ellis recently joined the company after having been associated with the City of Clarksdale Educational Department.

John C. Warner, formerly assistant comptroller of Monsanto Chemical Co.'s plastics division, has been elected secretary-treasurer of Mobay Chemical Co., a newly formed company jointly owned by Monsanto and Farbenfabriken Bayer, A.G. Leverkusen, Germany. Mr. Warner joined Monsanto in 1940 and has held the posts of chief accountant of the Texas division (1950), comptroller of that division (1951), and assistant comptroller of the plastics division this year, when it was combined with the Texas division.

K. A. Goodwin has been named to the post of northeastern regional sales manager of Dunlop Tire & Rubber Corp., Buffalo, N. Y. Mr. Goodwin, a sales and service field representative for United Aircraft Corp. from 1934-45 and later with Firestone Tire & Rubber Co., most recently as district sales manager in the New England area, will maintain his office in Buffalo. He will have charge of the Boston, Philadelphia, Buffalo, and Cleveland sales district under the recent revamping by the company of its regional sales facilities to strengthen its dealer organization.

William M. MacLean has been appointed general sales manager of the latex and reclaim division of Dominion Rubber Co., Ltd., Montreal, P. Q., Canada. Formerly market research engineer for the chemical, latex, and reclaim division, Mr. MacLean had joined Dominion in 1935. He served as liaison officer at Washington, D. C., to the United States, United Kingdom, and Canadian governments on the synthetic rubber program from 1942-45 and was loaned to the Canadian Defense Production Department from 1951-52 as assistant chemical controller.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Baldwin Rubber Co.	Com.	$0.25 extra	Aug. 2	July 15
		0.25 q.	Aug. 2	July 15
Carborundum Co.	Com.	0.35 q.	Sept. 10	Aug. 20
Circle Wire & Cable Corp.	Com.	0.40 q.	June 24	June 10
Dayton Rubber Co.	Com.	0.25 q.	July 26	July 9
	$2.00 Cl. A	0.50 q.	July 26	July 9
DeVilbiss Co.	Com.	0.30 q.	Aug. 2	July 19
Endicott Johnson Corp.	Com.	0.40 q.	July 1	June 17
	Pfd.	1.00 q.	July 1	June 17
General Electric Co.	Com.	*	June 11	May 5
General Tire & Rubber Co.	4¼% Pfd.	1.0625 q.	June 30	June 18
	3¾% Pfd.	0.9375 q.	June 30	June 18
	3¼% Pfd.	0.8125 q.	June 30	June 18
	5½% Pfd.†	0.9167 init.	June 30	June 18
	$5.50 Pfd.†	0.9167 init.	June 30	June 18
Goodyear Tire & Rubber Co. of Canada, Ltd.	Com.	1.00 q.	June 30	June 10
National Motor Bearing Co., Inc.	Com.	0.25 q.	July 1	June 21
O'Sullivan Rubber Corp.	5% Pfd.	0.25 q.	July 1	June 25
Parke, Davis & Co.	Com.	0.35	Aug. 2	July 6
Whitehead Bros. Rubber Co.	Com.	0.15 q.	Aug. 16	Aug. 2

*Stock distribution of two additional shares of common, $5 par value, for each share held.
†Covers period May 1 to June 30.

Estimated Pneumatic Casings, Tubes, and Camelback Shipments, Production, Inventory: April, March, 1954; April, 1953; First Four Months, 1954, 1953

	Original Equipment	Replacement	Export	Total	Production	Inventory
Passenger Casings						
April, 1954	2,785,343	4,327,745	95,018	7,208,106	7,030,579	12,954,839
Change from previous month				+9.10%	+2.22%	−1.20%
March, 1954	2,808,892	3,753,088	45,091	6,607,071	6,877,879	13,111,582
April, 1953	3,289,979	4,264,652	44,752	7,599,383	7,832,741	13,665,786
First four months, 1954	10,466,118	14,460,297	258,551	25,184,966	25,112,341	12,954,839
1953	11,656,467	15,134,505	147,598	26,938,570	29,423,064	13,665,786
Truck and Bus Casings						
April, 1954	345,757	607,407	81,355	1,034,519	1,034,188	2,951,136
Change from previous month				+1.20%	−6.23%	−0.49%
March, 1954	354,448	596,506	71,316	1,022,270	1,102,846	2,965,526
April, 1953	507,775	735,859	70,188	1,313,822	1,429,390	3,206,643
First 4 months, 1954	1,352,923	2,375,038	268,419	3,996,380	4,274,417	2,951,136
1953	1,978,006	3,153,292	223,719	5,355,017	5,720,042	3,206,643
Total Automotive Casings						
April, 1954	3,131,100	4,935,152	176,373	8,242,625	8,064,767	15,905,975
Change from previous month				+8.04%	+1.05%	−1.07%
March, 1954	3,163,340	4,349,594	116,407	7,629,341	7,980,725	16,077,108
April, 1953	3,797,754	5,000,511	114,940	8,913,205	9,262,131	16,872,429
First four months, 1954	11,819,041	16,835,335	526,970	29,181,346	29,386,758	15,905,975
1953	13,634,473	18,287,797	371,317	32,293,587	35,143,106	16,872,429
Tractor—Implement Casings						
April, 1954	210,543	146,685	9,295	366,523	323,238	629,381
Change from previous month				+0.06%	+5.67%	−5.40%
March, 1954	208,092	152,889	5,331	366,312	305,887	665,275
April, 1953	289,787	150,903	7,877	448,567	414,355	812,763
First four months, 1954	731,654	528,763	24,658	1,285,075	1,075,740	629,381
1953	1,168,204	557,095	21,657	1,746,956	1,680,528	812,763
Passenger, Motorcycle, Truck and Bus Inner Tubes						
April, 1954	3,133,534	2,769,816	97,190	6,000,540	6,266,271	11,233,717
Change from previous month				−0.21%	−2.07%	+3.35%
March, 1954	3,164,947	2,773,707	74,356	6,013,010	6,398,644	10,869,324
April, 1953	3,796,819	2,896,550	67,087	6,760,456	7,544,244	12,154,854
First four months, 1954	11,817,947	12,343,994	302,860	24,464,801	23,956,094	11,233,717
1953	13,640,964	13,475,154	211,174	27,327,292	27,787,858	12,154,854
Camelback (Lbs.)						
April, 1954	—	22,014,290	583,278	22,597,568	20,489,231	24,797,467
Change from previous month				+4.96%	−2.20%	−9.31%
March, 1954	—	19,968,914	1,560,240	21,529,154	20,948,890	27,342,714
April, 1953	—	19,024,320	828,800	19,853,120	21,519,680	33,013,120
First four months, 1954	—	81,126,976	3,357,620	84,484,596	83,410,199	24,797,467
1953	—	82,353,600	3,120,320	85,473,920	94,790,080	33,013,120

NOTE: Cumulative data on this report include adjustments made in prior months.
SOURCE: The Rubber Manufacturers Association, Inc., New York, N. Y.

CLASSIFIED ADVERTISEMENTS

Continued

MACHINERY AND SUPPLIES FOR SALE (Continued)

BANBURY BODIES, SALE OR INTERCHANGE. COMPLETELY Rebuilt. #9 and #3 body, each with door and cylinder. Complete #3 Banbury mixer, rebuilt, with motor and controls. Also many parts including 1 pr. new #9 rotors; 1 pr. #27 Banbury steel rotors, rebuilt; #27 Banbury side jackets, rebuilt. #27 Banbury bull gear, pinion and pinion shaft. Write INTERSTATE WELDING SERVICE, Specialists in Banbury Mixer Rebuilding. Offices, Metropolitan Building, Akron 8, Ohio.

4—HEAVY-DUTY RUBBER CHURNS, 42" X 52", 15 H.P., 387 GALlons capacity. Rebuilt. IRVING BARCAN CO., 249 Orient Avenue, Jersey City 5, N. J.

The Classified Ad Columns of RUBBER WORLD bring prompt results at low cost.

BUSINESS OPPORTUNITIES

U. S. Imports, Exports, and Reexports of Crude and Manufactured Rubber

Imports for Consumption of Crude and Manufactured Rubber

	February, 1954 Quantity	Value
UNMANUFACTURED, LBS.		
Crude rubber	82,799,646	$14,148,159
Latex	12,724,409	2,931,860
Balata	98,926	18,583
Jelutong or Pontianak	219,939	88,964
Gutta percha	74,249	28,464
Crude chicle	200,586	151,758
Synthetic rubber	2,051,801	550,991
Reclaimed rubber	272,345	23,462
Scrap rubber	1,387,571	61,235
TOTALS	99,829,472	$18,003,476
MANUFACTURED		
Rubber tires		
Auto, etc. *no.*	4,301	$220,336
Bicycle *no.*	4,607	3,301
Inner tubes		
Auto, etc. *no.*	666	1,986
Footwear		
Boots *prs.*	4,280	17,529
Shoes and overshoes *prs.*	28,536	15,685
Rubber-soled canvas shoes *prs.*	940	1,476
Athletic balls		
Golf *no.*	119,280	29,988
Tennis *no.*	53,100	14,804
Other *no.*	84,780	9,586
Toys	.....	22,977
Hard rubber goods		
Combs *no.*	20,472	2,287
Other	.....	7,884
Rubber and cotton packing *lbs.*	4,447	7,182
Gasket and valve packing	.....	5,980
Molded insulators	.....	9,439
Belting *lbs.*	2,276	2,794
Hose and tubing	.....	20,225
Gloves *prs.*	10,152	2,268
Nipples and pacifiers *gr.*	1,070	1,295
Instruments *doz.*	749	1,390
Soles and heels *lbs.*	4,700	5,426
Other	.....	697
Synthetic rubber products	.....	9,585
Gutta percha manufactures	4,575	4,680
Other soft rubber goods	.....	124,907
TOTALS	.....	$543,707
GRAND TOTALS, ALL RUBBER IMPORTS	.....	$18,547,183

Exports of Domestic Merchandise

	February, 1954 Quantity	Value
UNMANUFACTURED, LBS.		
Chicle and chewing gum bases	252,983	$94,436
Balata, gutta percha, etc.	853	1,948
Synthetic rubbers		
GR-S types	1,134,460	312,156
Butyl	4,680	1,038
Neoprene	2,801,115	1,246,543
Nitrile type	643,848	344,631
Other	126,404	87,926
Reclaimed rubber	2,108,170	189,724
Scrap rubber	2,480,468	55,116
TOTALS	9,552,981	$2,333,518
MANUFACTURED		
Rubber cement *gals.*	76,077	$138,321
And rubberized fabric *sq. yds.*	209,498	178,468
Clothing	.....	171,137
Footwear		
Boots and overshoes *prs.*	12,803	32,573
Rubber-soled canvas shoes *prs.*	12,051	28,273
Heels *doz. prs.*	71,016	79,764
Soles, soling, toplift sheets *lbs.*	774,972	228,395
Gloves and mittens *doz. prs.*	18,074	69,378
Drug sundries	.....	199,509
Toys, balls, novelties	.....	47,199
Hard rubber goods		
Battery boxes *no.*	35,063	72,242
Other electrical goods *lbs.*	198,146	134,042
Other	.....	32,283
Rubber tires and casings		
Truck and bus *no.*	57,443	2,351,782
Auto and motorcycle *no.*	61,398	782,840
Aircraft *no.*	4,989	339,674
Off-the-road *no.*	10,895	1,016,217
Farm tractor *no.*	3,789	174,218
Implement *no.*	1,890	39,127
Other *no.*	7,935	34,345
Inner tubes		
Auto *no.*	22,325	37,561
Truck and bus *no.*	39,002	149,071
Aircraft *no.*	2,656	15,728
Other *no.*	7,349	30,566
Solid tires		
Truck and commercial *lbs.*	1,762	43,824
Tire repair material		
Camelback *lbs.*	642,855	186,179
Other *lbs.*	261,195	195,173
Tape, except medical and friction *lbs.*	29,951	31,993
Belting		
V-type, vehicle, fan *lbs.*	75,620	108,460
Transmission		
V-type *lbs.*	87,627	172,715
Flat belts *lbs.*	52,289	71,361
Conveyor and elevator *lbs.*	84,635	67,492
Other *lbs.*	803	1,220
Hose		
Molded and braided *lbs.*	292,366	229,297
Wrapped and hand built *lbs.*	112,254	112,995
Other hose and tubing *lbs.*	95,487	103,504
Packing		
Sheet type *lbs.*	32,112	17,383
Other *lbs.*	171,107	261,729
Tiling and flooring *lbs.*	145,521	61,196
Mats and matting *lbs.*	520,168	187,810
Thread		
Bare *lbs.*	24,009	35,470
Textile covered *lbs.*	18,134	56,380
Compounded rubber for further manufacture *lbs.*	786,298	261,890
Other rubber manufactures	.....	633,665
TOTALS	.....	$9,222,449
GRAND TOTALS, ALL RUBBER EXPORTS	.....	$11,555,967

Reexports of Foreign Merchandise

	February, 1954 Quantity	Value
UNMANUFACTURED, LBS.		
Crude rubber	1,428,289	$383,05
Balata, gutta percha, etc.	600	1,20
GR-S type synthetic rubber	2,904	1,43
Scrap rubber	9,133	84
TOTALS	1,440,926	$386,54

SOURCE: Bureau of the Census, United States Department of Commerce, Washington, D. C.

Compounding Ingredients—Price Changes and Additions

Accelerator-Activators, Organic

Emersol 110	*lb.*	$0.12 /	$0.14
120	*lb.*	.125 /	.15
130	*lb.*	.1525 /	.172
210 Elaine	*lb.*	.14 /	.175
Groco 30	*lb.*	.105 /	.14
35	*lb.*	.11 /	.145
53	*lb.*	.1275 /	.145
54	*lb.*	.1325 /	.15
55	*lb.*	.155 /	.172
Rubber grade hydrogenated stearic acid	*lb.*	.09 /	.107
Hyfac 400	*lb.*	.0825 /	.102

Carbon Blacks*

Conductive Furnace—CF

Vulcan C	*lb.*	.105 / .15

High Abrasion Furnace—HAF

Vulcan 3	*lb.*	.079 / .125

Super Abrasion Furnace—SAF

Vulcan 6	*lb.*	.105 / .15

General Purpose Furnace—GPF

Sterling V Non-staining	*lb.*	.05 / .09

Extenders

Millex	*lb.*	.07

*At the request of the suppliers, the lowest prices shown for carbon blacks are for carloads in bags. Prices for hopper carloads are lower.

Trade Lists Available

The Commercial Intelligence Division recently published the following trade lists, of which mimeographed copies may be obtained by firms domiciled in the United States from this Division and from United States Department of Commerce Field Offices. The price is $1 a list for each country.

Automotive Vehicle & Equipment Importers & Dealers: Associated States of Indo-China; Japan.
Boot & Shoe Importers & Dealers: Venezuela.
Chemical Importers & Dealers: Greece.
Dental Supply Houses: Burma; Egypt.
Electrical Supply & Equipment Importers & Dealers: Denmark; Greece; United Kingdom.
Machinery Importers & Dealers: Burma; Canada.

United States Rubber Statistics—March, 1954

(All Figures in Long Tons, Dry Weight)

	New Supply			Distribution		
	Production	Imports	Total	Consumption	Exports	Month-End Stocks
Natural rubber and latex, total	0	47,721	47,721	53,709	460	112,829
Rubber, total	0	42,039	42,039	47,099	460	100,959
Latex, total	0	5,682	5,682	6,610	0	11,870
Synthetic rubbers, total	*48,552 †7,283	933	56,768	56,060	2,899	184,284
GR-S types‡	*43,372 †193	899	44,464	43,136	1,265	145,178
Butyl	*5,180	34	5,214	6,300	416	22,329
Neoprene‡	†5,190	0	5,190	5,190	930	12,575
Nitrile type‡	†1,900	0	1,900	1,447	288	4,202
Natural rubber and latex, and synthetic rubbers, total	55,835	48,654	104,489	109,769	3,359	297,113
Reclaimed rubber, total	23,305	78	23,383	22,882	830	32,148
GRAND TOTALS	79,140	48,732	127,872	132,651	4,189	329,261

*Government plant production.
†Private plant production.
‡Include latices.
SOURCE: Chemical & Rubber Division, BDSA, United States Department of Commerce Washington, D. C.

Financial

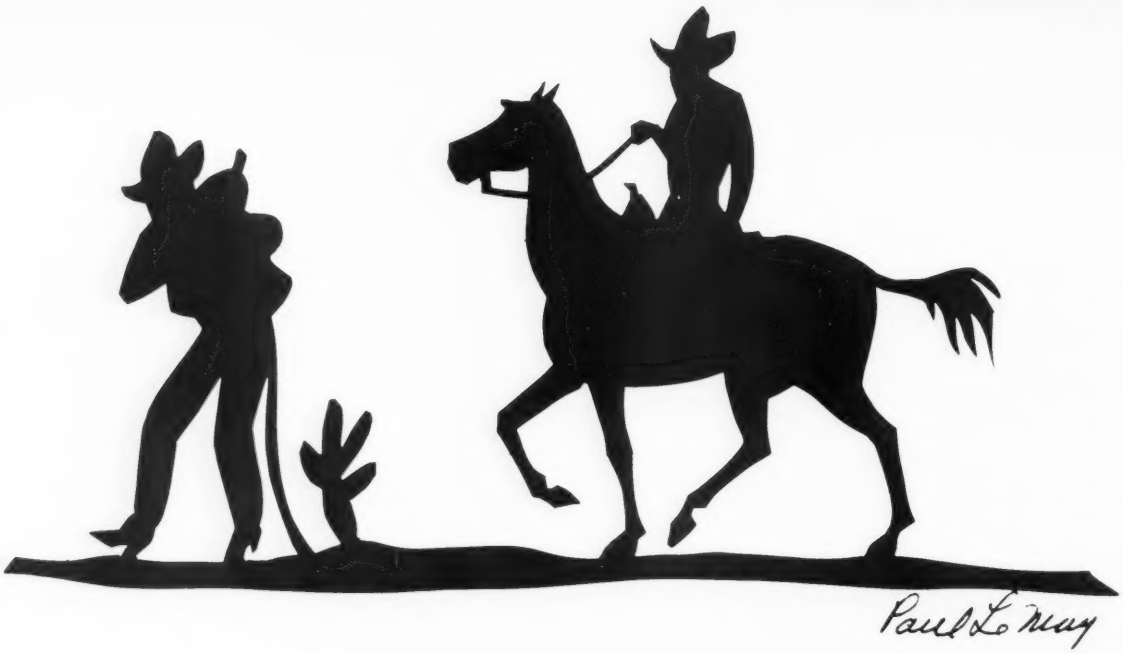
Dayton Rubber Co., Dayton, O. Six months ended April 30, 1954: net profit, $237,694, equal to 33¢ each on 587,589 common shares, contrasted with $877,271, or $1.41 a share, in the 1953 period; net sales, $22,755,259, against $29,892,546.

A. G. Spalding & Bros., Inc., Chicopee, Mass. Six months ended April 30, 1954: net earnings, $230,000, equal to 43¢ a common share, against $245,000, or 46¢ a share, a year earlier.

(*Dividends on page 574*)

INDEX TO ADVERTISERS

This index is maintained for the convenience of our readers. It is not a part of the advertisers' contract and RUBBER WORLD *assumes no responsibility to advertisers for its correctness.*



... helping hand

Make ***TEXAS CHANNEL BLACKS*** your helping hands for holding down material costs and reducing scorched stock.

Customers of the Sid Richardson Carbon Co. have no cause to worry about the increasing use of channel blacks or the diversion of gas from channel plants to pipe lines. Our own nearby resources and extensive production facilities assure you of our ability to meet your present and future requirements with a *continuing supply* of highest quality, economical-to-use ***TEXAS "E"*** and ***TEXAS "M"*** channel blacks.

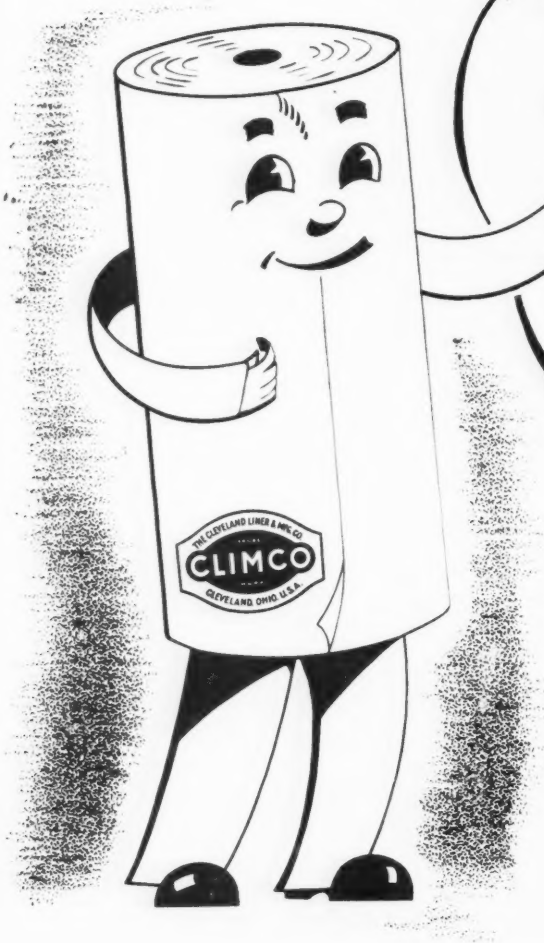
TEXAS
CHANNEL BLACKS

Sid Richardson
CARBON CO.
FORT WORTH, TEXAS

GENERAL SALES OFFICES
EVANS SAVINGS AND LOAN BUILDING
AKRON 8, OHIO

MR. CLIMCO SAYS.....

"CLIMCO LINERS separate perfectly from the stock"



Stock adhesions at any point in production mean time lost and extra expense. You can avoid such headaches by using Climco Processed liners that can be readily peeled from the stock without sticking.

Climco Processing of your liners assures many other profitable advantages: Liner life is greatly increased, tackiness of the stock is preserved, and gauges are more easily maintained. Latitude in compounding is enlarged, lint and ravelings are eliminated and horizontal storage is facilitated.

Since 1922 Climco Processed Liners have proved their worth to the rubber industry. Give them a trial in your plant.

THE CLEVELAND LINER & MFG. CO.
5508 Maurice Ave. • Cleveland 27, Ohio, U.S.A.
Cable Address: "BLUELINER"

ILLUSTRATED LINER BOOKLET

Tells all about Climco Liners and Linerette and how to get better service from liners. Write for your copy now.

LINERETTE INTERLEAVING PAPER
Treatment Contains
NO OIL OR WAX
Samples on Request

CLIMCO
PROCESSED LINERS

Serving the Rubber Industry for 32 Years

THE CLEVELAND LINER & MFG. CO. CLIMCO CLEVELAND, OHIO, U.S.A.

THE CLEVELAND LINER & MFG. CO. CLIMCO CLEVELAND, OHIO, U.S.A.